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ARCHITECTURE AT RICE  
GENERAL PLAN  
WILLIAM M. RICE INSTITUTE  
HOUSTON, TEXAS

SCALE — — — —

CRAM · GOODHVE · AND · FERGUSON · ARCHITECTS  
BOSTON AND NEW YORK



# A R C H I T E C T V R E

AT RICE UNIVERSITY

DESIGNATES A SERIES OF REPORTS  
ON THOUGHTS AND INVESTIGA-  
TIONS FROM THE DEPARTMENT OF  
ARCHITECTURE. IT IS PUBLISHED IN  
THE BELIEF THAT THE EDUCATION  
OF ARCHITECTS CAN BEST BE  
ADVANCED IF TEACHERS, STUDENTS,  
PRACTITIONERS, AND INTERESTED  
LAYMEN SHARE IN WHAT THEY ARE  
THINKING AND DOING.

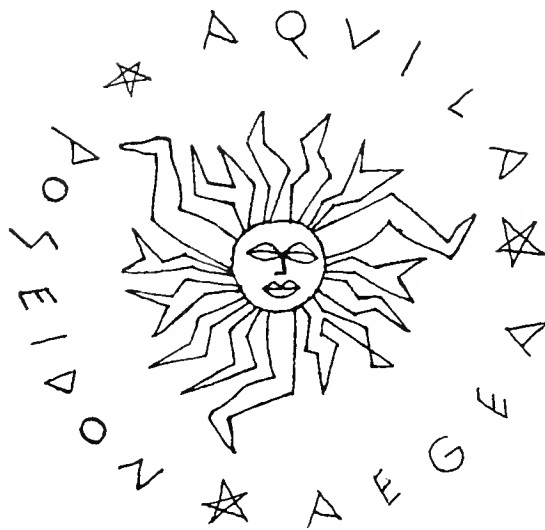
HOUSTON, TEXAS

SEPTEMBER, 1963

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THREE CITIES:



"Nous ne sommes plus à un moment où nous  
puissions nous payer le luxe de recopier le  
travail des autres."

(We are no longer at a time when we can  
afford the luxury of re-copying the work  
of others.)

JEAN GIONO, Virgile

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A Research Project Sponsored by THE TEXAS ARCHITECTURAL FOUNDATION

by

PAUL JACQUES GRILLO  
Professor of Architecture

and

Howard E. Eilenberger	5th year
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Stephen Bernhardt Engberg	4th year
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Chalmers Garold Long, Jr.	4th year
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Charles Franklin Redmon	3rd year
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Frank Stratton Kelly	3rd year
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Frederick Conrad Gardner	2nd year
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David Jefferson Morris	2nd year
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Cecil Harold Craft	1st year
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John Charles Rowlett	1st year
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Student Associates

## Bond Issue - Republic State Texas

issued - the third day of April nineteen hundred sixty three

Whereas: it has recently come to the attention of the people of the Republic - State of Texas that one Paul Jacques Grillo has endeavored to embellish the landscape of the aforesaid Republic - State and to inspire a humanitarian renaissance among its citizens with the design of three cities, (hereinafter referred to as Aquila, Poseidon, & Aegea) and an inverted department store complex (hereinafter referred to as Syelof, son of Kant - Alpes), and

Whereas: it is unreasonably certain that the cities of the great Republic - State of Texas are sprawling in the wrong direction, consuming our virginal sand-land like voracious beasts eschewing the city core and defecating in the form of suburban sprawl, and

Whereas: there appears to be more than enough people entrapped in our present freeway snarls to populate the such cities of a million people each (plus or minus not even one!) in the immediate future; and

Whereas: contemporary department store design undeniably resembles inverted septic tanks and usurp the citizens claim to adequate light and air;

Therefore: Hereby and herewith let it be known that the Republic - State of Texas awards this bond issue, duly approved by the voters of this glorious and progressive Republic - State, signed by each of the glorious and progressive pace-setter commissioners who are henceforth recognized as sympathetic and inspirational to the greater glory of humanism and Republic - State of Texas through city planning, holding forth on the commission of one Paul Jacques Grillo to the extent of a four trillion dollar and ten cent award for the express purpose of preparing final drawings (including electrical and plumbing riser diagrams) and supervision of construction of Aquila, Poseidon, and Aegea, and the conversion - inversion of Foley's and friends in accordance with the plans and specifications of Syelof.

signed:

Frederick C. Gardner 2  
Calvin G. ... 4  
David J. Morris 4  
Chuck Redman  
Stephen B. ...  
Howard ...  
...  
...  
Frank D. Kelly



## FOREWORD

*This project was started as a proposal I made to Chairman William W. Caudill to try to put together in a research project the ideas which have occupied my mind for the last two years on the design of new cities. The Texas Architectural Foundation backed my proposal with an M. D. Anderson Grant which covered the most urgent expenses in furthering this project. A group of students — a vertical cross-section of all the classes in architecture at Rice, from freshman through fifth year — were given the opportunity to work with me on this project in lieu of working on their regular school project. We started work February 4th, 1963, and closed shop on March 23rd.*

*This brochure records the work to date in the hopes that the ideas and solutions we offer will seem of enough interest to promote further this research with the final purpose of actually working toward their realization.*

*After all, with the trillion dollar and ten cent budget put at my disposal by the State Republic of Texas — as witnessed by the attached document — this should be feasible.*

*I was most thankful to the Texas Architectural Foundation for having made our venture financially possible, and to the group of students who helped me in putting it in its present shape. Selected on a voluntary basis from among the best students from all the classes, their role in this was more than just putting together the conceptual ideas I sketched throughout the study. Each one expressed his personal artistry and thought in designing his own share of this undertaking. The upper classmen acted as job captains of the various projects, while the others helped in model-making and drafting. Each of the job captains brought into his share of the design his characteristic personality as an artist: as revealed in the interplay of dynamic and static forms carried to an extreme detail as exquisite as a lace in the design of POSEIDON by Gary Long — as in the bold and forceful pattern carved into the plain in an abstract, man-made geography in the design of AQUILA by Chuck Redmon — as the playful interplay of land and water, residences, schools and industry expressed by Frank Kelly in AEGEA — as the realistic and practical solution of MIDDTOWN precised by Steve Engberg. Surely, I uncompromisingly sketched the concepts throughout this study without any possible misunderstanding, but without this dedicated team of enthusiastic and eager young designers, I would have been stopped short in the final realizations for lack of time, and the project would not have been carried out with the same freshness, nor with the same*

variety without their help. I might also have lost control of the research as a whole, as I would have been forced to lose myself in details.

Even though each of the students credited above carried a full responsibility on one of the cities, they also shifted along from one to the other, and exchanged at times their wits and work with others. Thus, Howie Eilenberger played an important part both in the study of Poseidon at the start, and Aquila at the end. In between, he composed a musical rhapsody which can be considered as a definite contribution to art. Steve Engberg had also his part in the study of Aegea, as he was given to develop the concept of what I call the "Corporative Village," which is expressed in the interplay of business and residence in the design of the shore area of the town. Gary Long teamed for a while with Frank Kelly on this same project and analyzed with him the other sites that could exist in Texas under similar conditions.

As for the two freshmen, Cecil Craft and Jack Rowlett, were responsible for making the models. The model of Aquila (page 31) shows the professional quality of their work on such a large and intricate design. The model measures 4 by 8 feet. This achievement is mostly due to the evening hours of work which Cecil Craft spent in the shop, carrying at the same time his full school load which, as we all know, is particularly heavy on a freshman's shoulders.

I must also thank the administration for giving us unlimited space in the basement of Fondren Library where the students in their spare time could freely use the shop facilities for model-making and other diversions.

The immediate vicinity of the library was most welcome, and our shelves became rapidly stocked with books on botany, natural morphology, zoology, etc. However, architectural literature of any kind was purposely ignored to keep intact our mistakes. After all, our job was not to compile the results of experts, but to offer something different, no matter how way-out in the margin we had to go from things already accepted and done. I strongly believe this to be our most valid contribution to this fantastically hard and baffling problem of designing a city from scratch. Upon these few original and basic ideas — original because they go back to the origin of things and meet thus with already well-known and successful natural solutions — basic because they may serve as some kind of a base to go further in the study of the problem — we hope to be given the opportunity, in a second phase of this game, to build documented and convincing evidence to show with facts and figures the immediate feasibility and the practicality of these solutions. The first step would be to

*expose these ideas in a film aimed at the man in the street, to help win his interest and cooperation, because without his support, we can never hope to make a success of city planning. Thanks to Anderson Todd, who gallantly filmed a first reel on Aegea, we are already started on this venture.*

*We are not apologizing for having limited ourselves in this first phase to a decidedly romantic approach by skirting figures and statistics from a safe distance, although never quite losing track of their gross value. I think it is mostly due to the blithe simplicity of our intuitive confidence — together with our willfully ignoring the obsolete Victorian straight-jacket of ordinances, laws, codes and regulations which constitute the bible of contemporary city planning — that we may have to offer with our work anything of value at all.*

*Paul T. Gillo*

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Houston, 20 May 1963

Within the next twenty years, we will have to build in California alone the equivalent of twelve cities the size of San Francisco to face the increase of population...within fifty years, the population of the United States will have doubled.

The Press

## INTERLUDE

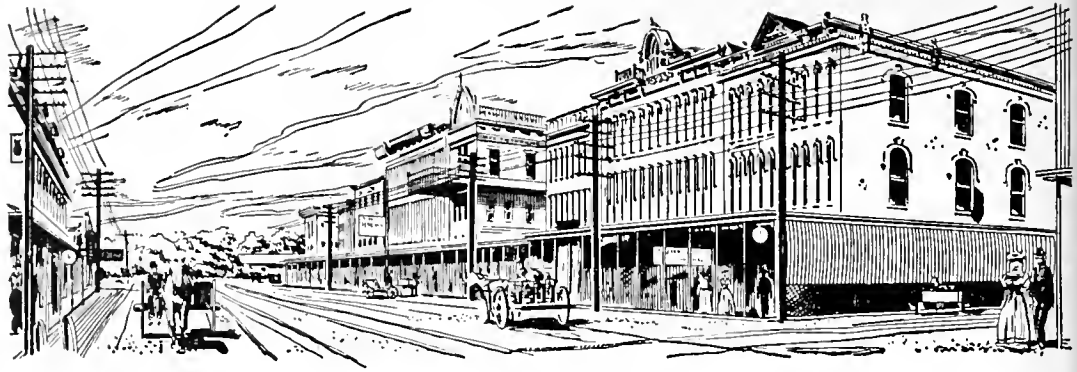
We can no longer expect to solve the problem of housing our increasing population by extending our existing cities. The designing of new cities, long considered as utopian, has now become a reality we must face — a problem most difficult to solve. Hitherto, cities built from scratch, without being complete failures, fail to satisfy our way of life. Brasilia, Chandigarh are still examples of one man's dream to which the people do not respond. The solutions are too foreign, too abstract from the ancestral urge of the people who are called to live there to create the state of mind, the collective conscience toward city life without which the most superb thoughts about city planning remain failures. Perhaps this is the very reason city planning is such a baffling failure: because the people have no part in it, and leave it to the experts to decide how they should live. The arguments offered by these experts are mostly on the purely aesthetic or economic side. Architecture has become a secret rite performed by high priests in a lingo unintelligible to laymen. As a result, the little people keep building their own shoddy shacks to enjoy fishing, while the mandarins take over the town and compete in mutual hatred to raise monuments to their own ego.

It is very much as in painting. We, the new barbarians, have come to accept only one-sided solutions under the dictatorial flag of one man's philosophy. It gives us a sort of security to see thus catalogued in black and white the production of an artist. The greatness of contemporary masters is not evaluated through their ability to accept a great variety of solutions in the art of building, but through their ability to corral themselves within a restricted area of design technique. How disturbed our young generation of students in architectural schools would be if suddenly Le Corbusier decided to build with steel or wood, or if Mies van der Rohe launched a reinforced concrete structure. It is so wonderfully safe and satisfying to be able to tag a man with a material, a technique, a philosophy, no matter how restricted or dogmatic. I met recently a student from another university who, speaking about his experience in learning architecture, told me with delight that his first

year hero was Frank Lloyd Wright, his second year god was Mies van der Rohe, and, now in this third year, he swears that Le Corbusier is greater than all. I know a painter who can not have a show because he keeps searching for new expression and fails to offer a reassuring stereotyped technique which would flag his work as a trademark. His only mistake is that he does not know enough to stop to think. He keeps experimenting instead of trying to exploit a rubber stamp formula which, at least, would make his wares safely recognizable by the art critic. Would a cigarette manufacturer think of changing the color of his pack or the shape of its letters? Camel once yielded to the temptation to think, and we know what happened: sales dropped disastrously and the Camel people had to make a public apology in a double spread in LIFE Magazine, and give back to the public the dear little pyramids.

Come to think of it, however, what about Picasso, shifting from blue romantic nudes to Guernica? What about Beethoven, piling up his Grosse Fugue on top of his early quartets, his happy little Eighth between two sacred monsters, his rosy, pre-Haydnian sonata after the Appassionnata? What about the universal genius of Vinci and Michelangelo? They probably would not have a chance today. Because today, we are only reassured by ultra-dogmatism, although our double tonguing preaches freedom and broad-mindedness.

In spite of this danger of disturbing the peace, we chose in this research project to investigate not one but three very different possibilities in city design. If we limited our choice to three, it was not because three was some sacred number, but because of the lack of time to bring into light the rainbow of other solutions — just as logical and necessary as a mathematical theorem — which are given not by one man's genius, but the infinitely varied bounty of nature. Our land, our climate, our soil and all that makes the natural environment and the natural landscape are what we call a site. We returned from our short journey dazzled by so much wealth of potentiality and hoping to be able to continue this cruise in wonderland at a later date.



MAIN AT PRESTON—1887

Our contemporary cities have no heart because they disregard people.

They accumulate buildings to show off the might of powerful business and industry, but not to make life more delightful for human beings. No one seems concerned any more about the welfare of the pedestrian. What happens to him when it rains? When the town is lashed by a blizzard? Or when the sun is high and burning in the Texas summer noon and there is no place to hide?

This disregard for people is not, by far, an American phenomenon. The first people who built American cities showed, on the contrary, a remarkable concern for the comfort of the shoppers. Look at old Houston, for instance, as shown on the first page of its telephone book: the sidewalks are completely covered, from wall to curb, by non-assuming but very efficient, low canopies which protect graciously against excessive sun and rain. If we remember that at that time electricity was unknown — which meant poorer lighting in the shops — we have no excuse today, when, with artificial light, the darkest corner can be floodlighted at will.

The "center of town" is usually a right angle crossing of two streets, one called Main Street, and usually running north-south, and the other wearing some famous name. Structures line-up the crossings, as at all other crossings nearby, arid and arrogant as canyon walls. They raise their windowless walls to the full height permitted by the code. What are they? Septic tanks for giants abandoned by some careless contractor during a coffee break? Mausoleums where for a fee we might glimpse at the embalmed corpse of a king of haberdashery? No. They are buildings, buildings for people to enjoy: department stores and others, mostly frequented by women and children.

A city is beginning to lose its personality as a city when its people start moving out of its center to live in suburbia. The distance, thus increasing between places of work, entertainment, and culture on one hand, and places to live on the other, creates an abyss between all the delight that a city has to offer and the very life of the people who are born to enjoy it. When a person lives at a distance of more than

Once low canopies  
protected the pedestrian.



Now a desert of  
concrete and asphalt.

The center of town — a  
crossing of two streets lined  
by windowless structures



half-an-hour's drive from the symphony hall, he hesitates to go to the concert, especially when he has TV entertainment at home at the tips of his fingers.

No decent lawn may grace downtown. It is a desert of concrete sidewalks and parking lots decorated by consumptive potted trees. However, a man will spend hours mowing, trimming, weeding, feeding, watering and worshipping his handkerchief of a lawn, because without a lawn of his own, he feels lost. Why, though, should a Texan, or a New Mexican, or an Arizonian feel so desperately addicted to a landscape so foreign to his land? New England frustration? Yankee lore? What is wrong, then, with the landscape of Texas, New Mexico, Arizona or even super-desertic Nevada? Have we gone so soft that we can't take it in all its integral beauty, in its authentic grandeur? Do we need that badly the security of Northern Tradition? Oedipus complex? Did not the Egyptians, the Persians, the Greeks welcome their country as it was — desert, barren islands and burned rocks — and manage to make of their intact landscape the eternal home of the gods of art and beauty?

Look at suburban Houston. It could be suburban New York, or suburban Chicago. It offers the identical display of the well-known variations on the ranch-house theme, the Tudor-Gothic theme, the Baltimore-Colonial, and the so-called French-Provincial, of course. Streets offer exactly the same pattern, as though transplanted by some magic carpet, untouched, from Philadelphia or Boston.

We like our suburbs. We are proud of them. We don't realize that they kill the spirit of a town. Desperately alike, they fight climate, site, latitude, sun and rain, and look like pathetic displaced persons everywhere. They seem to possess the same fanatic righteousness as those missionaries who insist, the good souls, on clothing polynesians with Mother Hubbard's wardrobe and making ivory black natives sing-song the rhythmless, washed-out hymns of their white church. What is wrong with black rhythm and native art? What kind of a game are we playing if we kill it in its homeland and praise it in our museums? What is wrong then with the beauty of an original landscape that spells Texas more forcefully and radiantly than any man-made, enameled sign pasted on the back and front end of a car?



Arid and arrogant  
as canyon walls.



Windshield windows in  
eye-less buildings.



n mausoleums.

These few remarks, among others, may be summarized in a few axiomatic statements upon which is based the philosophy which lead to the design of the cities shown hereafter:

1. A CITY WHICH IS ALLOWED TO GROW INDEFINITELY LOSES ITS VALUE AS A CITY. It becomes a cancerous agglomeration.  
Corollary: A limit should be assigned to the size of a city.
2. A CITY IS A SITE. It lies within a certain geography and micro-climate which shall determine its form, its elements, its architecture.  
Corollary: There can not be two cities alike in their design.
3. A CITY CEASES TO BE A CITY AS SOON AS PEOPLE DESERT ITS CENTER TO LIVE IN SUBURBS.  
Corollary: Cities should be so designed to make people happy to live in the very heart of town. It should be planned for their delight.
4. WATER SUPPLY HAS BECOME A WORLD EMERGENCY.  
Corollary: We must design the new architecture to gather water with all surfaces exposed to rain, the finest source of pure water on earth.
5. WATER IS A NEED NOT ONLY TO SUSTAIN LIFE AND INDUSTRY, BUT AS A VISUAL AND PSYCHOLOGICAL ELEMENT OF DELIGHT.  
Corollary: The new city must be placed near a large body of water. If built in arid regions, it must be designed to provide a water oasis through man's technology.
6. ATOMIC POWER WILL REMAIN FOR A LONG TIME THE MOST EXPENSIVE SOURCE OF ENERGY.  
Corollary: We must not consider it as the most obvious source of energy for the future, but design our cities for the use of free sources of natural energy, mainly solar energy.
7. THE CAR HAS TO GO. It must go where it belongs, meaning out of the center of the city. We have lived too long with the absurd slogan: The car is here to stay. The oversized car is no more an element of delight, but a smog-making machine and a source of panic for whoever tries to park it downtown.  
Corollary: Means of public transportation must be made inexpensive, easy, and delightful. Other types of small, individual vehicles should be designed to not contaminate the atmosphere of the city.
8. STADIOMANIA IS SLOWLY CRIPPLING THE AMERICAN YOUTH. Recent surveys show it: too many cars and not enough exercise.  
Corollary: A large area of the city must be devoted to the practice of sports for the individual, fewer golf clubs for retired businessmen and more practice fields for the youngsters. The increase of leisure over labor should become an incentive toward self betterment, physical and cultural, rather than a danger by allowing people to rely on lazy entertainment at home or crowd pageants to spend their time.

Uptown



Downtown

The first statement, which imposes on a city a limit of growth, may seem the most controversial. Are we not proud today to quote the yearly increase of a city in its population, as though this purely statistical achievement has anything to do with the evaluation of its character? It is hard for us to visualize any city government willing to accept as an article of faith that once the city reaches a certain quota — one million citizens, let us say — it should gently, but firmly close its gates to further immigration, but after all, were the nation's fathers so wrong in creating an immigration quota in their new world? Are the most revered and highest centers of knowledge so wrong when they limit their enrollment to a certain number of students and thus steadily raise their standards?

Let us try to give a few more convincing reasons for limitation.

In the past, cities were built within protective walls. These were walls of defense, raised against invaders. These walled-in cities — Rome being the most famous of all — have managed to become the greatest we know, and continue to carry on an extraordinarily delightful life within these walls. They have become complete organisms: renewing their cells as life progresses, building and rebuilding their harmonious body as time changes in the language of every century with new tools and new means, forever contemporary.

But why should we build today a city within a boundary? Do we have to defend it against invaders? Are we back in the Middle Ages?

Invaders, today, are not Huns, equipped with bow and arrow and clad in wolf skins. They are worse. They are equipped with brushes, ladders and large billboards which they plant at the city gates and in the open landscape. They are equipped with bricks, mortar and tar paper which they assemble in clusters of nondescript "company towns" encamped like assailants at the eve of a siege, all around the city. They are mostly the marauders who steal here and there a bit of landscape, a stretch of beautiful beach, a slice of lakeshore or a patch of forest to build a speculative resort, not for the good of the people, but for the success of their own finances. Their coat of arms bear a gold bulldozer on a field of fallen trees. They are the landscape-robbers. Their game is played in the open. We actually encourage it, as a mathematical proof of prosperity. When we wake to the disaster, it is too late. Egrets and mourning doves have left forever, magnolias and green oaks are felled to the ground, replaced by potted plastic foliage and broken beer bottles given away by Sunday nature lovers. By then, we are surrounded, cornered with ugliness and bad taste, robbed of our dearest and most absolute constitutional right: our right to enjoy the countryside, the forest, the farmland, the beach, the clouds, the sky, and the song of a bird.

By assigning a limit of where to build, we are not limiting the rights of people. We are not attempting at what we call so fallaciously, freedom. We are protecting them against robbery and vandalism. We are giving them back their own right to step out of a city into authentic and untouched farmland, forestland, or ocean shore. We

are only aiming at saving our right to enjoy our country.

This, of course, means considerable legal problems. But, in the need for new cities today, we are faced with the necessity to establish new regulations, new codes to fit this new emergency. With the purpose of protecting our dearest American heritage, we may start with a few radical and simple measures:

1. No new city should be planned at a distance less than one hundred miles, or thereabout, from another large city.
2. New cities which are being built should be limited to a population of one million souls, or thereabout, and not increase their size outside their boundaries.
3. Smaller towns within a hundred mile radius of the city should be allowed to grow, but not more than one-third their actual size, so as to keep their character as small, hometowns, justly proud of their personality and not lured by local politics into becoming baby-Chicagos.

Higby, in his remarkable book, *THE SQUEEZE*, has shown with impressive figures and facts this emergency facing the United States as a question of life and death of a culture, of a way of life, and of one of the most extraordinary and most beautiful lands that nature has bestowed the world. Massive arguments may be found in the book in favor of the walled city. From Boston to Washington, the East Coast is rapidly becoming an uninterrupted stretch of suburbia. The 4,000 odd miles of shoreline along the Atlantic seaboard and the Gulf of Mexico, unprotected except for a few hundred miles of national reserve, is becoming a wall of private shacks, tenth-rate resorts (see Galveston Island) shoddy towns and beer can regalia. A necklace of shame. Do we deserve this? Yes, if we accept it as a sign of prosperity, if we accept anything built as a sign of prosperity, if we admit that any increase, whether in people, industry, square or cubic feet of production of any kind is progress, if we admit that size and quantity are the only things that matter — yes, if we admit that we should disregard quality.

Now, we may ask, why one million people? Why not two? Why not less than one million?

If we consider the size of the great cities of the past, and great cities of contemporary United States, we notice that, apart from a few "sacred monsters" such as New York, London, or Paris — to quote only from our Western heritage — a city becomes really a city after the half-million mark. Then, it can afford the very best: a great symphony, top-level higher education, theatrical performances of world renown, etc. A city of a million has acquired also the kind of magic anonymity which comes as a blessing to a city which has grown above the town gossip level and hands back to its citizens the freedom of individuality.

Above the million mark, the spreading of its territory from the city core becomes devastating for human relations and communications.

Suburbia takes over the life of the city. It jells in little clusters around the periphery in what we call "neighborhoods." These are agglomerations of builders' homes packed around a standard shopping center and tied together by clubbish ties, where families live in clannish isolation among chosen "neighbors" who belong to the same club, the same church, the same school, unaware of what goes on in the flock of the next ranch, too far from the heart of the city to go to the symphony or the Alley Theater, glued to the TV screen, perfect lawn-abiding citizens barbecuing spare ribs in their backyards with the same chosen friends in sacrifice to lost Indian lore and pioneer tradition.

This process of uncontrolled growth and its destroying effect is already made quite sensible in Houston, in spite of the brave attempt to breach interstellar spaces of suburbia by a formidable lattice of super-highways. Only a few years back, Houston was hovering around the million mark. Few homes extended beyond Memorial Park. Bellaire was another town. Sharpstown or Gulfgate did not even have a name. Now, due to its rapid growth, Houston sends its citizens to live so far from the core of the city that they can not commute more than once a day, no matter how dearly they love their car. The rest of the time, they ignore the city. They are not Houstonians anymore; they are only taxpayers of a city called Houston where they have their jobs, commute once a day back and forth from their little flying carpet of grass imported from New England.

Texas is a big, big land. But look at what happened to New England. The land has already been gnawed and chewed away by highways, shopping centers, parking lots, factories, and millions of acres of builders' developments, so that now its magic charm is lost. Nature had to abandon the fight in favor of Main-Street-Unlimited. It has happened there, it can happen here. Do we care enough to try to do something about it?

The geography of a site — meaning its climate, its terrain, its land and water characteristics — determines the form and the character of a city as forcibly and naturally as the form and character of a landscape and its natural inhabitants, animals and plants.

We know how different and immediately recognizable from others are the cities of Thibet, for instance, or Persia, or of the coast of Norway, of the shores of the Mediterranean. We recognize also with wonder a similarity of design in cities extremely distant from one another, belonging to people who never influenced one another. They are water cities — such as Venice, Bangkok, or Amsterdam — mountain cities — such as Lhasa, Taos, or Macchu Picchu. The reason for their similarity is to be found in their geography.

There can not be one general solution for a city, any more than for any program of architecture, but a great many varied solutions due to the infinite variety of the geography of the earth.

Forced to limit our choice between the variety of city designs thus made possible by nature, we could have chosen some among the most beautiful existing landscapes of the country. We preferred instead to

orient our research toward the new landscape developed through man's ingenuity and industry to reconquer areas of land hitherto unused or forsaken by the conventional builder. Other countries, pressed by the increase of population within a small territory, have thus increased considerably the surface of their real estate. Holland, for instance, gained millions of acres over the sea and the gulf of Zuiderzee, where not so long ago five fathoms of water covered the ocean floor and now harbors are thriving and farms and prosperous villages. In Italy, the "Bonifica" program has transformed within a decade the malaria ridden Pontine Marshes into an agricultural paradise.

Now, if we consider the shrinkage of territory available due to the rapid and disorderly increase of building as a national emergency — what Higby calls the "squeeze" — we must also try to find solutions to make better use of our land and even to increase its territory by redeeming bad lands and tidelands, even though today we may think that America in general and Texas in particular possess unrestricted vastness.

By the same token, we felt we should concentrate our research on architectural solutions that would permit the saving of water, even though we may think that we have enough today to lavishly water our lawns. If we care to read the conclusions of hydrology experts, however, we are told that the scarcity of water supply has already become an emergency in the world, and that within the next decade, quite a few of the major American cities will have to solve their water problem through distillation from sea water and brackish lakes as there will not be enough natural fresh water to fill their needs. This is no secret. Every kid who reads the Sunday paper knows it.

This means that we must design a water-conscious architecture, using all roofs and roof surfaces, all concrete areas, to gather rain water into cisterns and even to develop new techniques dating back to Pharoah's time to gather air moisture into "air wells" such as described by the author in the "United Nations Conference on New Sources of Energy, Rome, 1961," published in an earlier issue of ARCHITECTURE AT RICE (No. 2, 1961). This means a radically new concept of architecture, seriously tied with engineering emergencies, more closely than ever before in symbiosis with nature, using the environment as a friend, nature as a helper, heat, cold, rain, snow and wind as dearest allies, and not as enemies to be fought with air conditioning and other expensive weapons. This means the renaissance of a truly great anonymous art of building, instead of the abstract game of spacial wits to which it has fallen heir in the hands of the mandarins.

In the light of these few remarks, and if we take Texas as the possible location for new cities, we come to recognize a great variety of geographical conditions within the very boundaries of the state, which should lead to a great many different solutions within this varied natural context. Gulf shore conditions, for instance, offer possibilities dramatically different from the conditions existing in the Texas Plains. Within short distances, microclimates create individual conditions unique in the world, such as in the Houston area, the lower Rio Grande, and many others.

In Texas there are three areas where man's technology can help gain land and produce a new landscape:

### 1. The Plain

Here, nature has created an abstract landscape, a limitless horizon, a flat or near-flat land where man can express his own creations in pure geometry, as did the Egyptians in Memphis, in what we might call a cosmic landscape, where the path of the sun and the stars lead the imagination of the poet toward pure realizations of the mind. This natural condition exists in the enormous area of the territorial United States, called the Great Plains, from Canada to the Gulf of Mexico. It occupies an important part of Texas. We chose this site for our first project, AQUILA, the "Research City," organized for scientists to live as in a cruise ship during the time of their research. The modifications of the geography of the site are accomplished through advanced technology of spot atomic blasting.

### 2. The Artificial Lakes

These are created by dams on the course of rivers as large reserves of water for irrigation and human use. This condition, again, is widely spread throughout the United States territory and the world. The Tennessee Valley Authority program of Tennessee and the Trinity River Project in Texas are typical examples, as also are the larger lakes created in mountain areas, such as Boulder and Hoover Dams. It is interesting to note that the Texas farmer showed us the way long ago by building his "tanks" throughout Texas where he constructed small earth dams to hold water reserves for his cattle. We will find our inspiration in these authentic native inventions when designing our lake city, which we call AEGEA because of its kinship with the island cities of the Grecian Archipelago.

### 3. The Tidelands

We are familiar with this typical American landscape, with its laguna and sandy islands covered at high tide and its marsh lands teeming with wild life. It is characteristic of the Gulf of Mexico shore line, but also found on most of the Atlantic shore. The shallow tidelands may easily be dredged into a lattice of canals and raised land gained on the sea and designed into cities such as Venice or Amsterdam. We placed our new city under the symbol of POSEIDON, lord of the sea.

In designing Poseidon, we considered using only the usual technological means of motor-dredging and bulldozing, as do Florida builders when they dig canals to create water neighborhoods. In designing Aquila, we would consider advanced atomic technology, as mentioned above, in excavating a large area by means of controlled spot atomic explosions below grade. In the design of Aegea, the only modification to the natural landscape we plan to use is through the building of earth dams

to multiply the interplay of water and land and increase the beauty of landscape already graced with rolling hills and dense pine forests.

We also chose these three geographical conditions because they are not only typical of Texas, but may be found in other areas in the United States, and over the world. This confers to the solutions a generality which, to our opinion, may strengthen their value. All three are designed for a capacity of one million people.

As a supplement to this study of three cities, we also offer a solution in urban renewal in Midtown America. This is shown as an answer to our criticism of the degradation of all downtown areas because of the desertion of their residents in favor of suburbia and because of the building of arrogant, windowless monsters which we compared to septic tanks unhappily placed above ground instead of being placed where they belong, below street level. Actually, all utilities buildings which, in a very near future, will be completely automated (such as parking garages, telephone buildings, and others) should be placed in the ground, thus liberating the precious sunny soil for human use and delight.



The golden age of the city was during the Middle Ages.

A true free social spirit animated these towns. It was the "guild" or corporative city. Such were the towns along the German rivers, economically linked together by the Hansa. Craft and industry were intermixed with dwelling, because industry had not yet become objectionable company for living. Various industries automatically grouped themselves by quarters, in which people of the same trade lived close together. This condition still exists in towns of the Moslem world, such as Fez, where the city is made of many individual quarters, each one devoted to one particular craft, the souks.

The coming of the machine changed this situation: coal and smoke became characteristics of the industry and made it necessary to confine it outside living quarters. Thus was created the "other side of the railroad," where plants and factories operated in a degraded neighborhood.

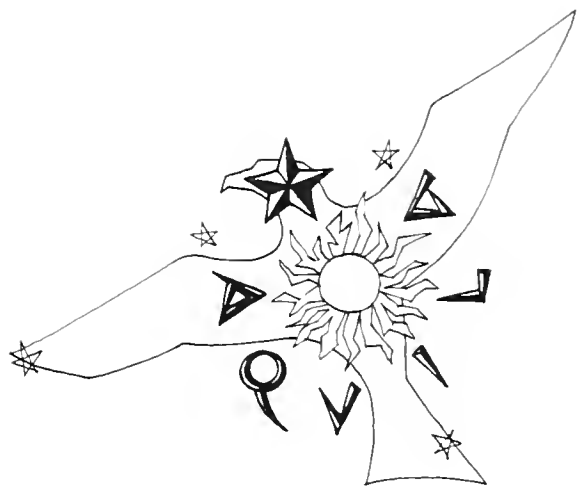
The divorce was considered as a "fait accompli," without possible return.

As a result, the whole social structure of the city changed for the worse. Neighborhoods became anonymous arrays of boxes for living. The warmth of social relations vanished, to be replaced by a kind of missionary welfare concept of human relation, which found its expression in the "service clubs" we have today. The personal attention to a neighbor became the anonymous United Fund Drive, a sort of automatic Charity Tax which made us feel satisfied to have thus fulfilled our social duties.

To the coal age of industry succeeded the electric age, and now the atomic age. To dirt and grime has succeeded clean and silent power. The generating of electricity through nuclear and solar plants will eliminate the use of other smoke producing fuels.

It has now become possible to place industry back right into the living room of the city, and eliminate the "other side of the railroad" type zoning.

In the design Aquila we have placed the most important plants and laboratories in the center of town. We have made of its airport the central feature of the design, and oriented the whole city according to the direction of the dominant wind for landing crafts. In the design of Aegea, although we have placed the heavier type on the periphery of the town, we have incorporated also light industry, business, and work with residences, so that people can actually work where they live, without wasting time and energy in commuting. The section on page 52 shows this integrated concept. The geography of Poseidon, however, made us spread the industry as a belt alongside the ship channel, and orient the residences toward the bay and the gulf shore, but the interplay remains between work and residence, because of the narrowness of the island the short distance from bayside to channel side.



"We are concerned not merely with the technical problem of securing and maintaining peace, but also with the important task of education and enlightenment."

ALBERT EINSTEIN, On Peace

## AQUILA

This city is designed as a research capital, focusing its activity around the integration of the two areas of research: life research and inert research.

Life research would be aimed at everything alive, starting with man — medicine, surgery, psychology, etc. — and covering the animal and plant world. Problems of food and life would be of primary concern. We could also call this the area of welfare research.

Inert research would encompass the whole area of cosmic science, from astrophysics to electronics and the technology of everything designed by man for his own use. Its purpose is to improve machines and tools and put into use sources of energy such as the sun, the wind and similar natural sources.

This would become the world Mecca of science and thought, a living symbol of our confident aspirations toward a better world of peace.

For instance, scientists would analyze what it does to man to live within the Faraday cage of a metallic curtain wall building thus sheltered from all natural radiations during a great part of his life. Eye specialists would stop in time harmful windshield designs which increase eye ailments and distort vision, solar specialists would help industrialists design compact and efficient solar batteries, sun powered motors, and other devices.

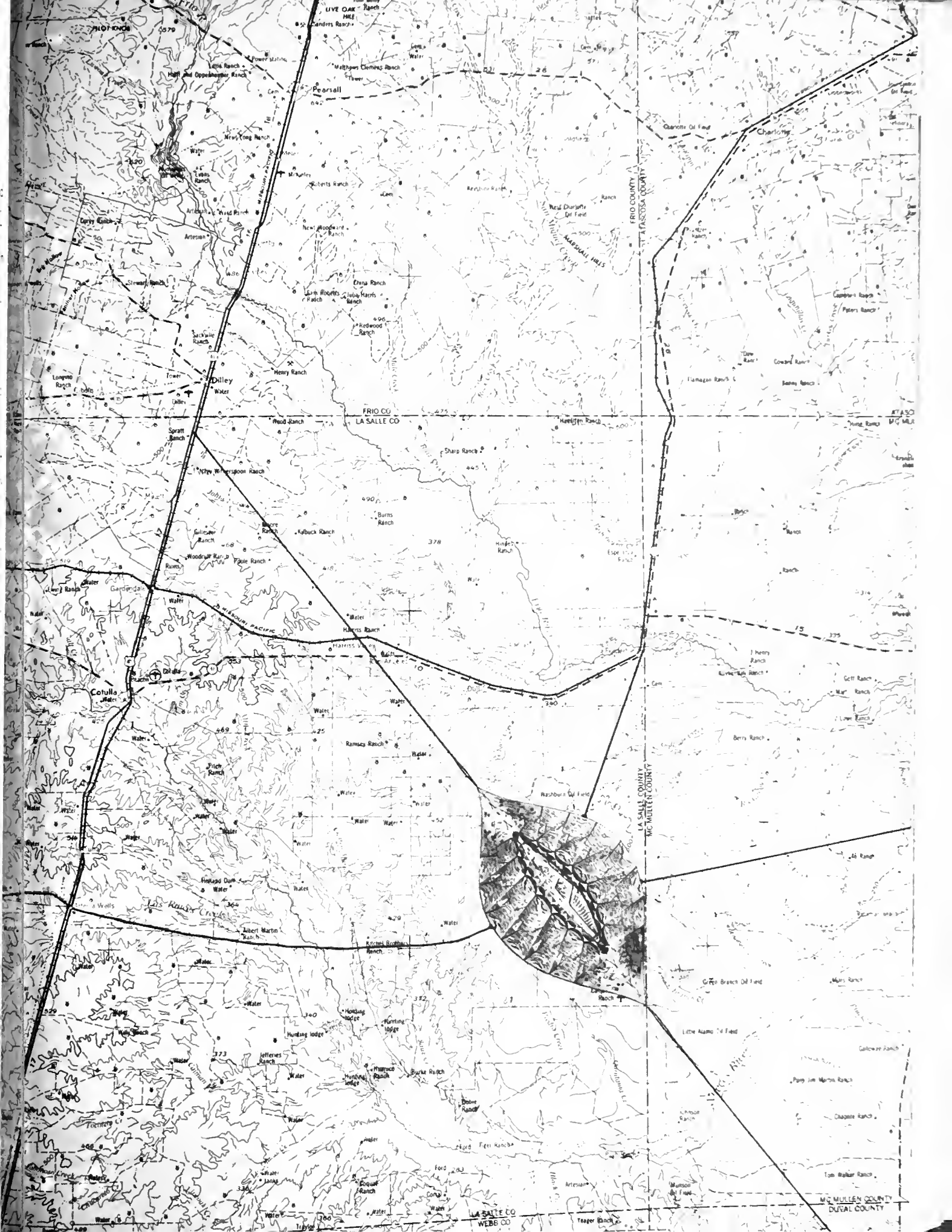
All scientists would work in close quarters, building a better world in which man can live. They would come here to live as on a scientific world cruise, planning to spend one or more years of their lives in research, replaced in turn by other scientists.

This gives a clue to the design of AQUILA more as a ship than as a city of permanent homes, essentially aimed at a transient population of researchers and their families. This led us to the design of its acropolis, housing in its flanks 100,000 people in cliff dwellings.

In 1913, the cultivatable surface on earth was 20 per cent greater than in 1963. At this rate of "progress," how will the earth produce enough food to feed a population doubled within the next fifty years? Unless we look forward to a dinner of algae, of chemically fabricated protein pills and artificially flavored synthetic fruit juices (we are already on the way) we have to consider agricultural land renewal as an emergency just as urgent as urban renewal.

We are familiar with the eternal feud between town and country, between agriculture and industry. It is very similar to the feud between cattle ranchers and farmers, so aptly put in the musical comedy with "Oklahoma."

Inasmuch as it is essential to bridge the gap between the "Two Cultures," it is essential for the unity of a society to reconstruct a closer relationship between agriculture and industry, to place them both on even footing of comfort and living standard, so as to avoid the desertion from the land in favor of industrial cities.



The new city should then also be an agricultural town: whence our design of an agricultural oasis in the very heart of the city.

The live exploitation of land creates the most peaceful and complete landscape to lay our eyes upon. In the same way that we propose the radical step of moving the industry right into the living room of the city (on the Acropolis and under miles of airplane runways) we also feel that we can, to a certain extent, move farming right around our living room. Instead of vast expanses of sterile and useless parks, we would like to see prairies grazed by cattle, orchards and fields properly husbanded into a productive landscape.

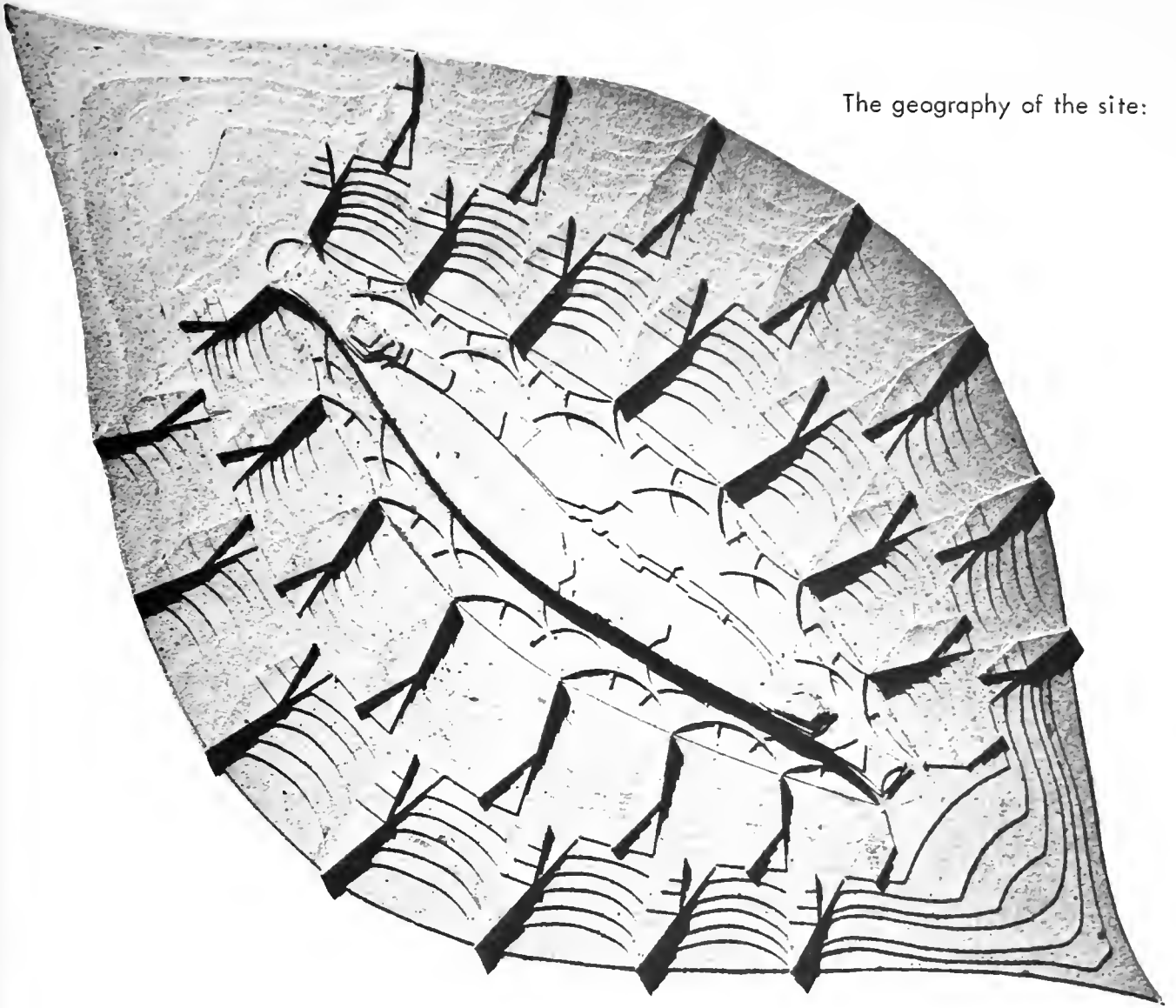
One of the immediate advantages of thus reducing the distance from producer to consumer would be the possible development of quality products otherwise difficult to transport, such as the thin-skinned berries, fresh and tender vegetables, etc., which would give fame and attraction to our particular city, and take out of our economical system the cellophane wrapped toughies, and other products of the New Glacial Age.

In this research city, renewed old ways of farming, which still make us wonder about our progressive methods, such as true organic farming, floating gardens as are still found today in Cashmere, experiments in breeding toward better quality rather than easier transportation, and full development of products fit to the micro-climate, would make us aware of the bounty of the land and bring delight to our kitchens.

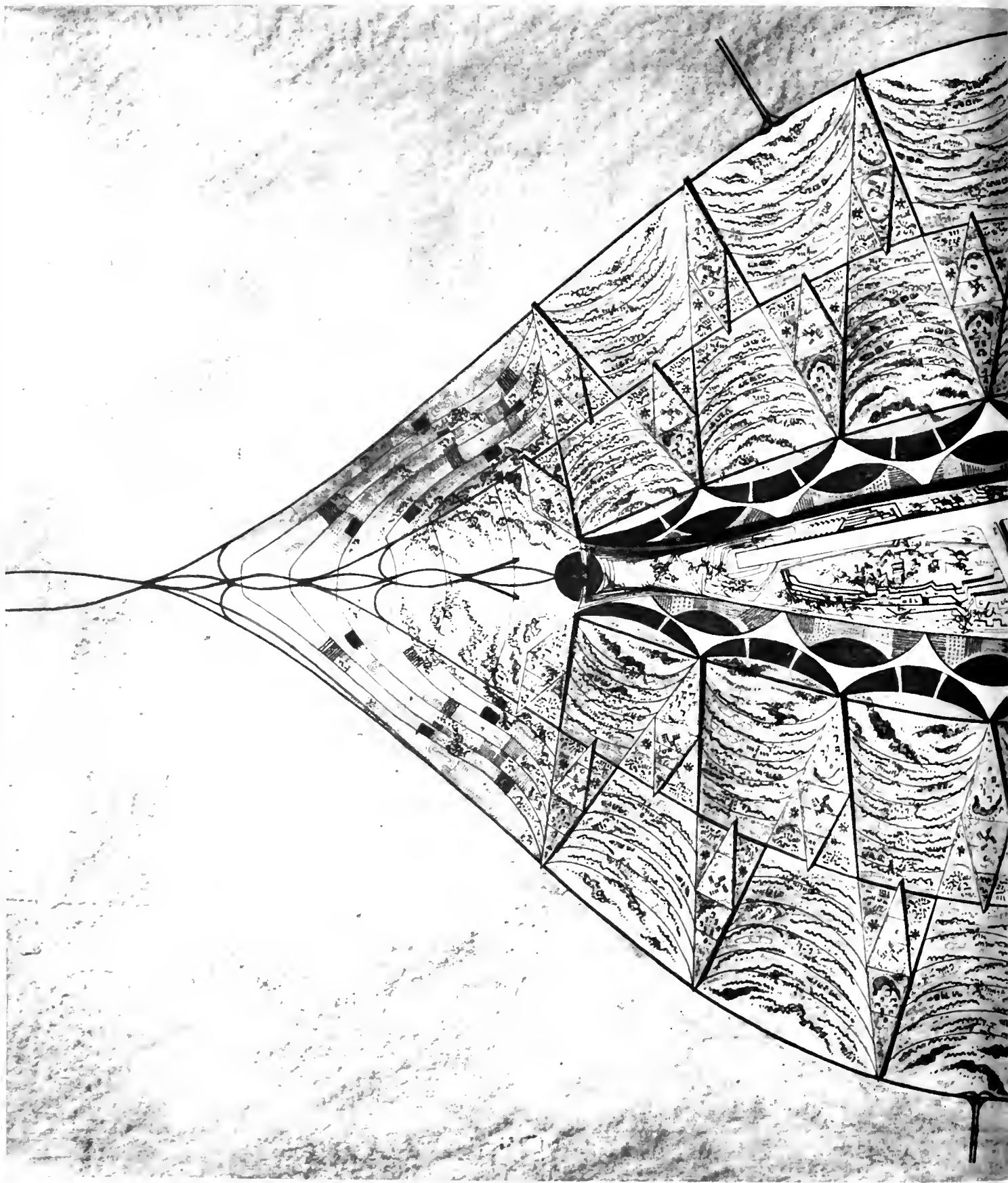
As for public parks and sports, we would try to make use of most of the available land into fields of physical development, so that the entire population could play baseball, football, tennis, etc., instead of being forced into the stadiomania of our great cities where 50 thousand round-shouldered human beings gather in an hysterical rite to shout at the exploits of a dozen helmetted, shoulder-padded, knee-reinforced and broken-toothed young athletes whose professional job is to kick a ball. The English showed the way by creating side by side 111 soccer fields near London after World War II, redeeming the huge area of Hackney Marsh into a sports paradise. The urgent need for better individual physical training for American youth was shown by a series of physical tests conducted recently. American children failed at the rate of 57.9 per cent, whereas European children failed only 8.7 per cent. As quoted by Edward Higby, "Don't walk if you can ride, don't stand if you can sit, don't sit if you can lie down, and if you get the urge to exercise, lie down until it passes off."

This explains in our design the transitional area between the Oasis and the bulk of the city residences (what we call the Crater), where the Oasis bleeds within the triangular "towns" in large areas of green fields and water areas for the practice of individual sports. Each triangle houses two kinds of dwellings: high rise apartments along the sides, and pueblo-like terraced residences within their sloping surface. Each triangle meets at its base along a rapid service transit which links all these towns together, each one housing an average of 30,000 people. These "crater" dwellings house more permanent residents than the cliff dwellings and confer to the whole city its social stability.

The geography of the site:

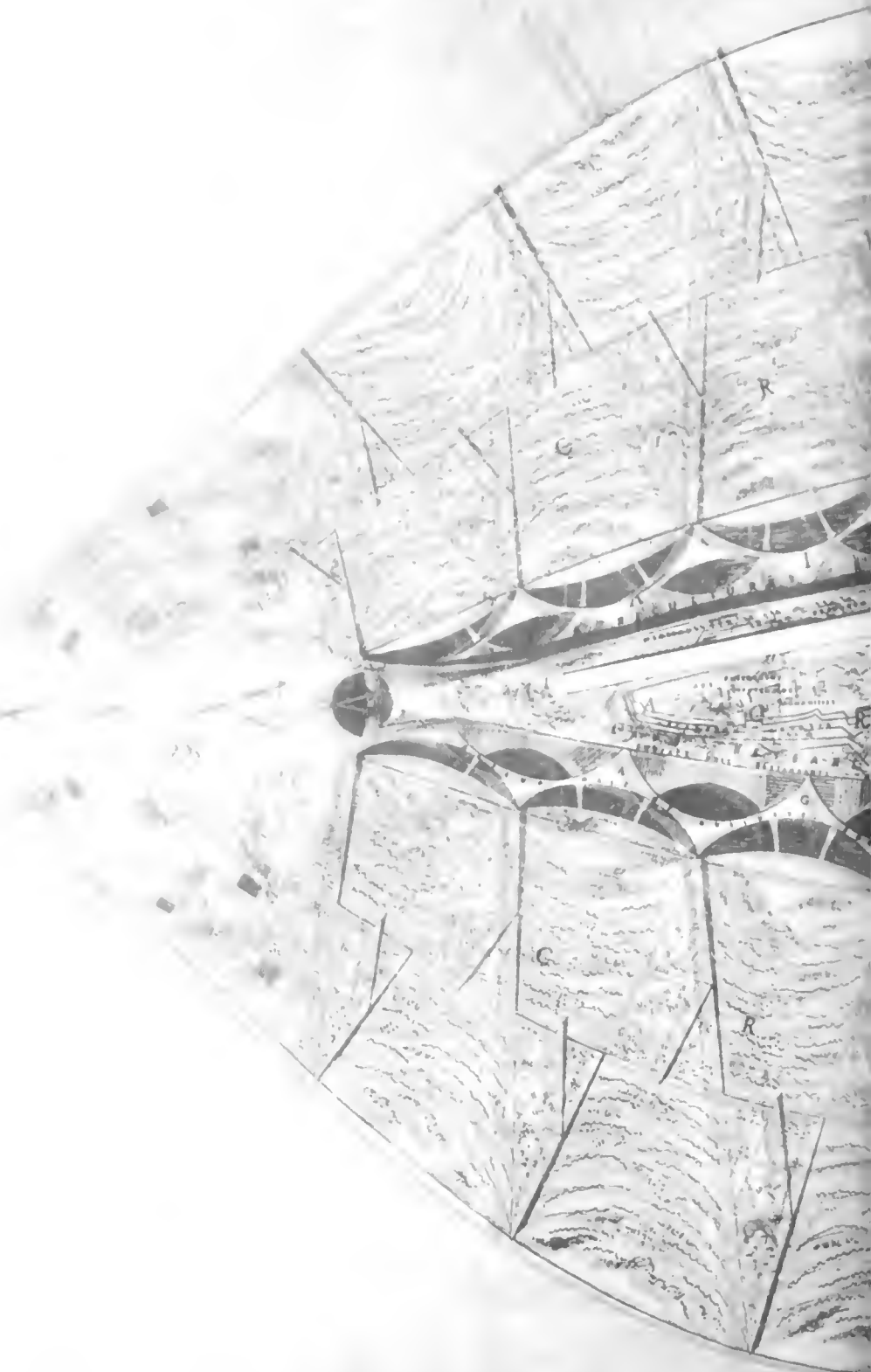


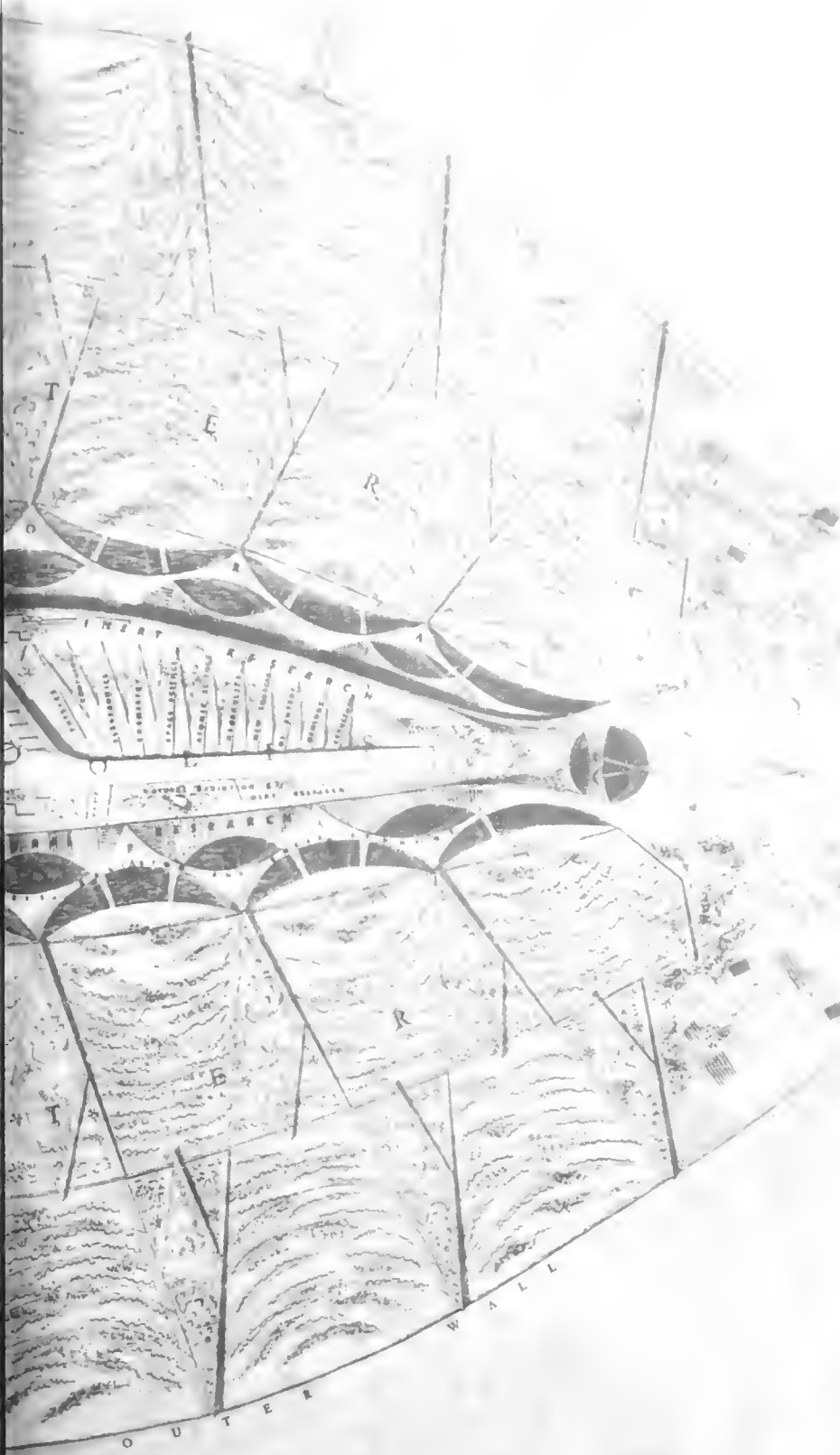
The natural site — a widely eroded plateau — was deeply carved through spot atomic blasting to a depth of 250 feet at the lowest level (the Oasis). The soil thus excavated was accumulated in the center to create the Acropolis which culminates 400 feet above the floor of the Oasis. Modern technology renders possible the creation of a vast crater in which subterranean water may collect and also where all surface water may drain thus creating a perfectly irrigated land for farming as well as creating lakes for sport and fisheries. The climate of this man-made sunken oasis may also be modified at time of frost to protect delicate crops and orchards. Instead of the usual tar-bombs which heat the atmosphere in citrus fruit orchards during California and Florida winters, we would have a system of canals heated with atomic energy that would turn a gentle heat on the whole area during hard freeze alerts.



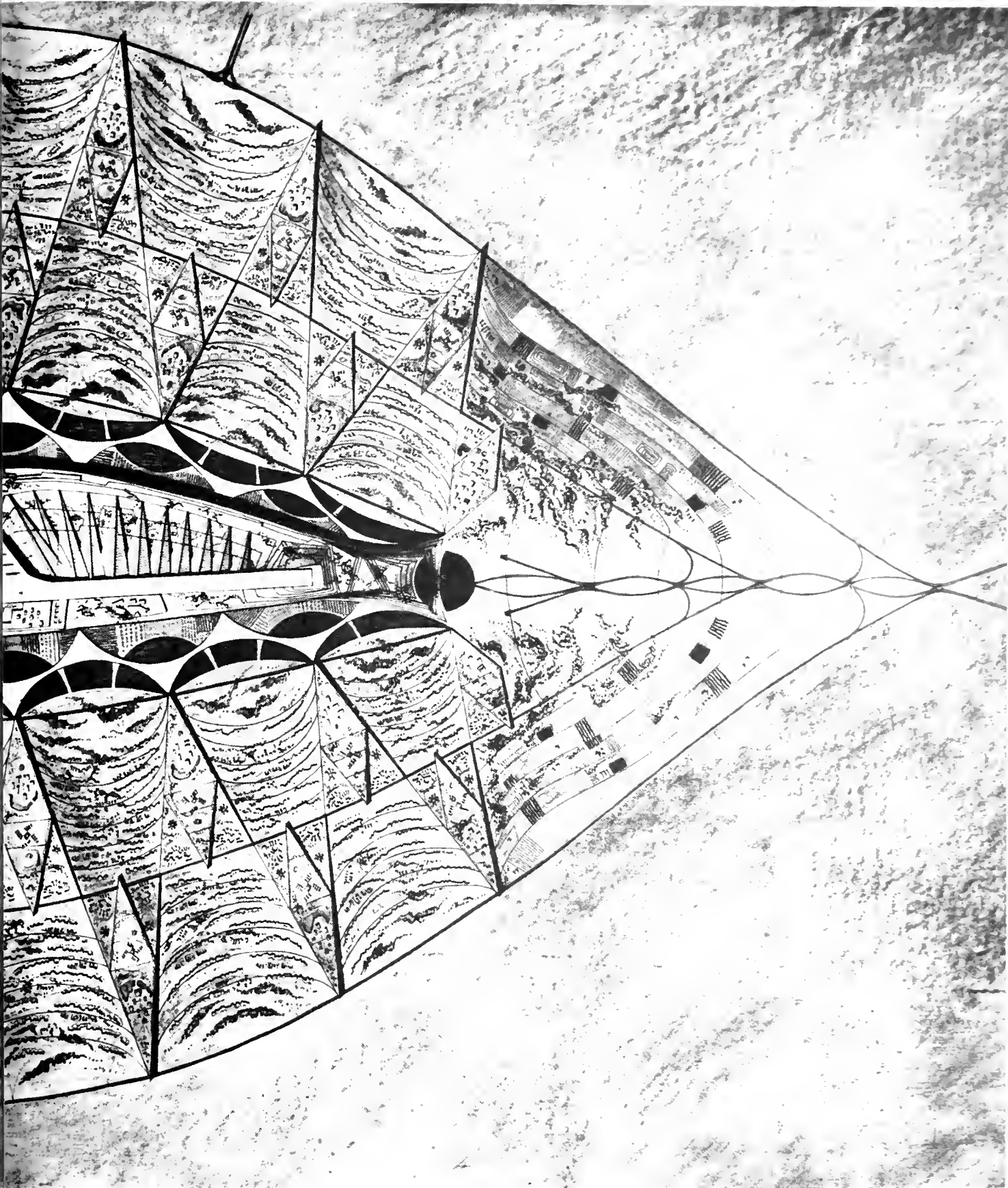


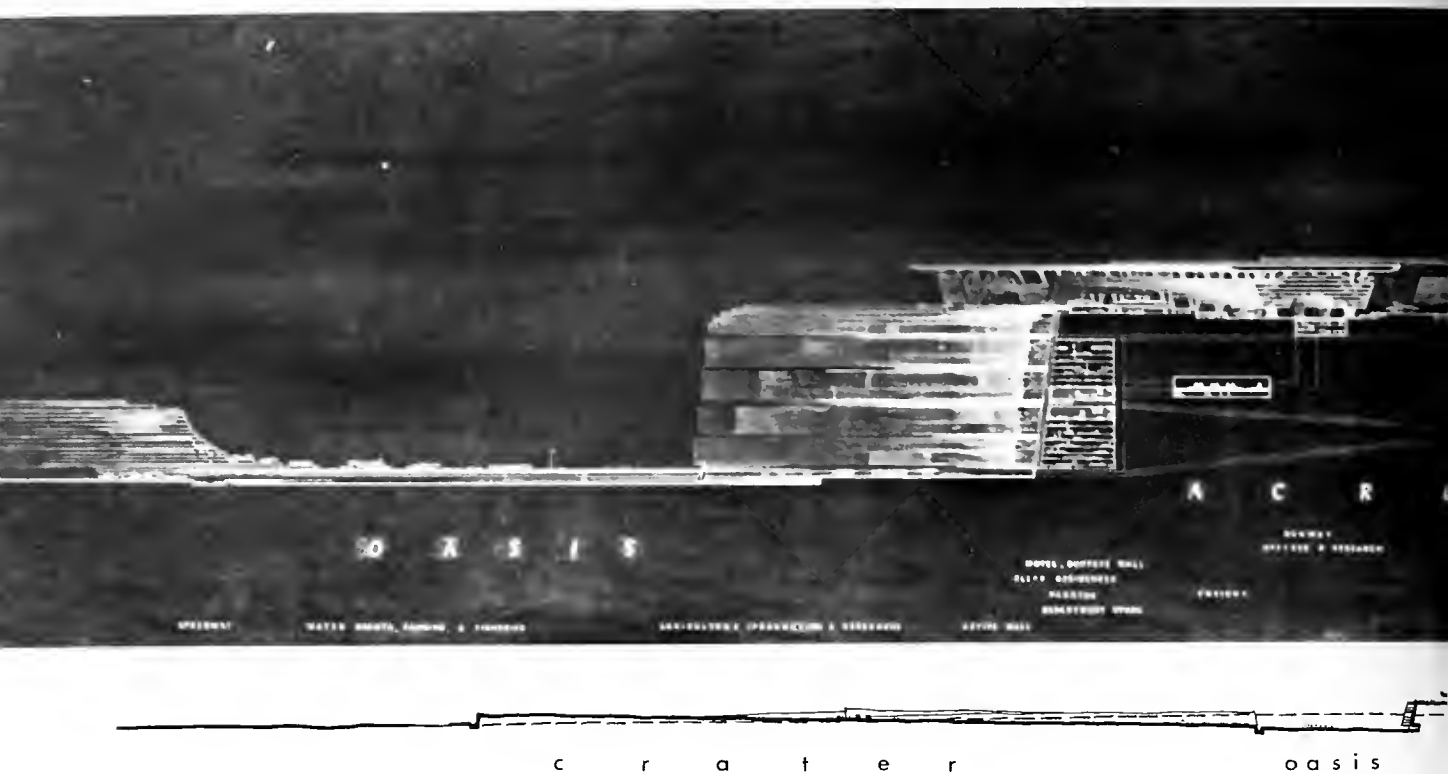
San Antonio  
95 miles











The airport is located in the very center of the city, and the planes land atop the Acropolis on elevated runways under which are placed research plants and offices. This solution, similar to a plane-carrier ship, was adopted for speeding air traffic. Passengers are debarked in a terminal which is part of a 10,000 room convention hotel and in the very center of the area reserved for city government and the "top of the town." Freight, on the opposite side, is dropped in a freight terminal adjacent to plants and offices.

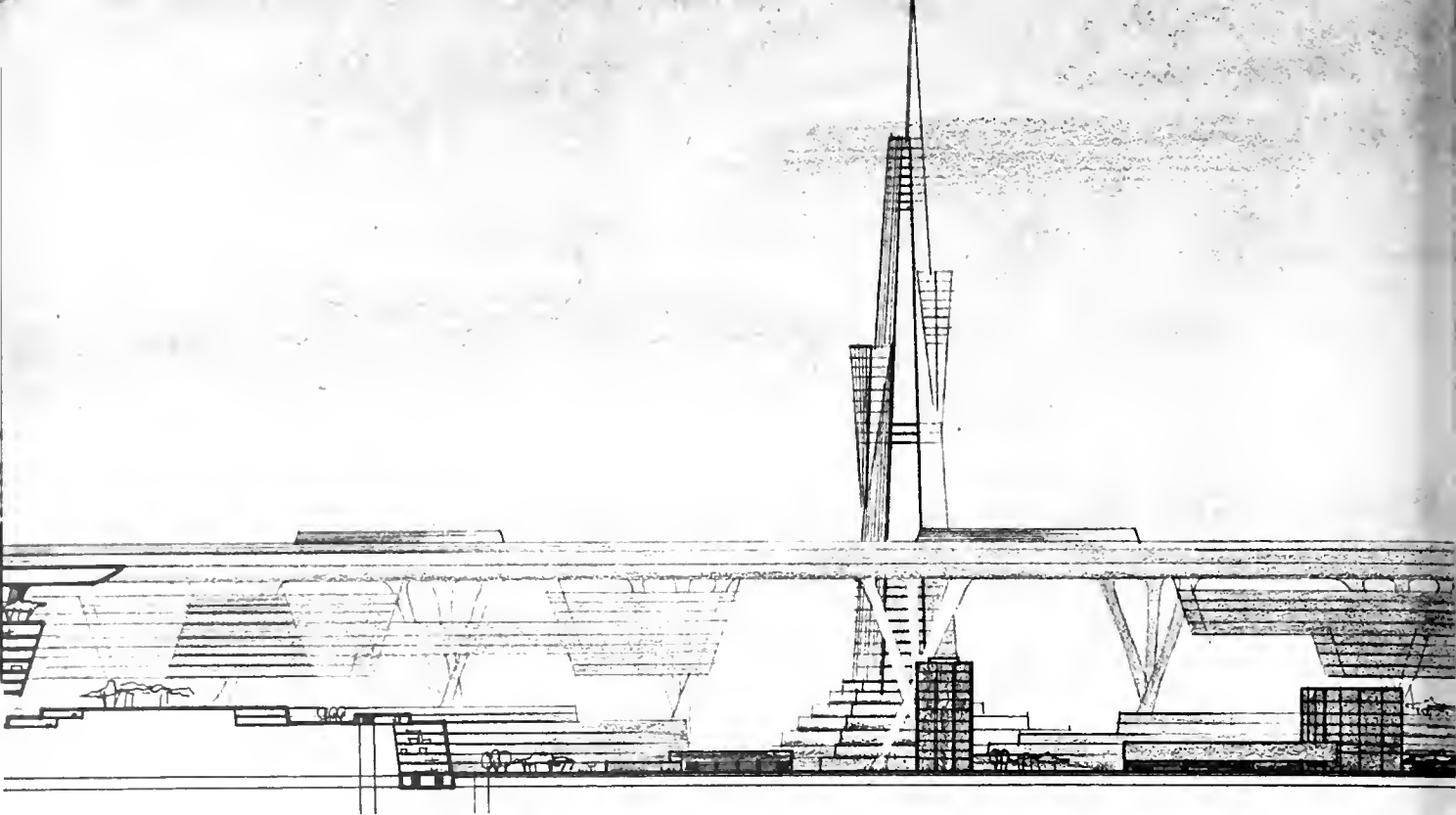
The runways, oriented to the direction of the dominant winds (NE-SW in the area), can accommodate the largest and fastest jets.

The main objection to this location is the noise problem. We assume that in a short while jet planes, like speed cars, will be equipped with silencers. This solution is already under study by engineers. After all, landing a jet in La Guardia Field in the heart of New York is no different than in AQUILA and the New York City Port Authority has curbed the level of noise due to landing crafts when flying above the city.

Another objection is the structural strain imposed upon built-up runways. We will notice that the point of impact of the planes is directly on earth, and the particular structure of the twisted tree-trunk hollow columns which hold the runways is thus designed to counteract the stresses in all directions. This, by the way, opens a new approach to earthquake-proof structures as the kind of stresses due to jet landings on a flat surface may well be compared to a small earthquake.

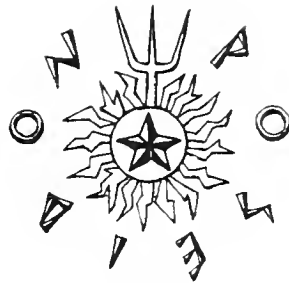
Within a decade, vertical take-off and landing will gradually replace jet transportation, and render unnecessary the use of the major part of the runways. By that time, the technology of solar energy will have come of age. The runways will then be used for solar equipment and collectors.





The top of the Acropolis is gently carved into a large crater allowing for terraced buildings to spread out from its center. These are located in the main areas of work (university, research laboratories, carrels, etc.). On the outer edge are lined up residential motels, restaurants, and other places of public life.

The Convention Hotel, rising high above the city, carries a beacon of light which signals the burning light of man's research and guides the airships across the sky.



"Poseidan, indeed, was alloted the whole island which he called Atlantis, after his son, Atlas...

...Atlantis had everything which both in a city and every other place is sought after as useful for the purposes of life. And the people was supplied indeed, with many things from foreign countries, on account of their extensive empire, but the island afforded them the greatest part of everything of which they stood in need...

...And they dug a trench three acres in breadth and fifty stadia in length. And that ship might sail from the sea to the part, they enlarged its mouth, so that it might be sufficient to receive the largest vessels... They likewise joined by bridges those islands of earth so that with one three-banked galley they might sail from one island to the other, and covered the upper part of the islands so that they might sail under them.

...In each island there were many temples of many Gods, together with many gardens and gymnasia. The docks, likewise, were full of three banked galleys, and of such apparatus as is adapted to vessels of this kind... and the bay and the greatest harbour were full of ships and merchants that came from all parts...

...Ditches one hundred feet in breadth, being out at a right angle from the Great Trench were separated from each other by an interval of one hundred stadia. The inhabitants brought wood to the city from the mountains, and other seasonable articles, in twofold vessels, through the trenches; for the trenches intersected each other obliquely, and towards the city. Every year, too, they twice collected the fruits of the earth through the streams deduced from the trenches...

...And these were the subject of my meditations while I was a boy..."

PLATO, Critias

## POSEIDON

The necessity for people to enjoy ocean shores has lined the coasts with resort towns or cities. It resulted in a temporary and ultra-commercial character in their design. Even though these settlements make their living with the natural beauty of the sea, they don't capitalize on the natural resources. The hotels offer imported foods, and their holiday architecture is everywhere the same, whether in Miami or Acapulco.

Tourist towns tend to degenerate into begging towns, unless they possess an industry based on local natural resources which makes them independent from the fleeting tourist trade and gives the city a stable life of its own, regardless of season.

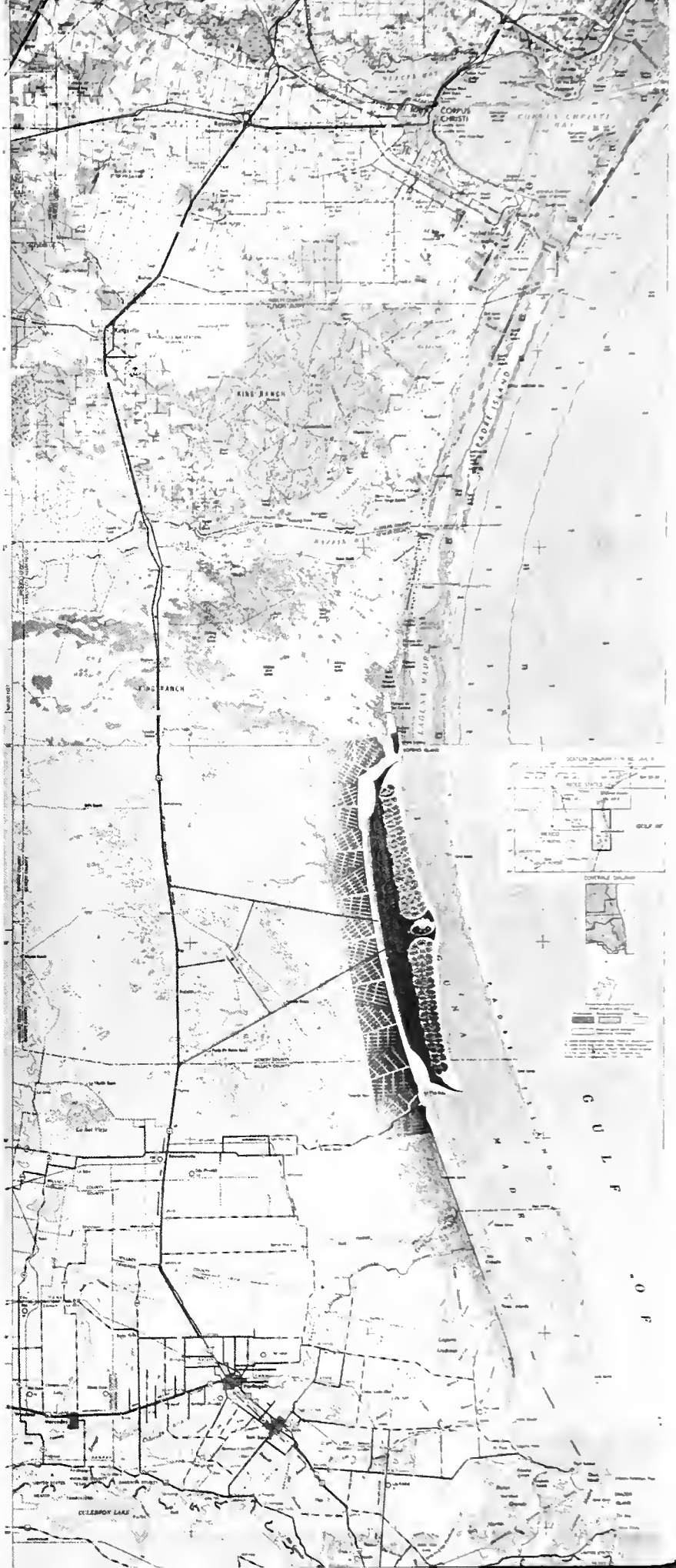
With the speed of air travel, a citizen of Dallas can put skis on his feet in the Rockies three hours from his home. In less than one hour, he can reach any spot on the Gulf of Mexico. Gradually, however, the free shore land is chewed away by speculative private resorts, and will soon restrict the whole shore of Texas to the few fortunate enough to own a summer home in one of these resorts. Galveston Island is thus gradually built up with fences, and non trespassing paradises-lost. The time is not far when no land will be available along the sea to build the outlet Texas needs for its sea loving inland population.

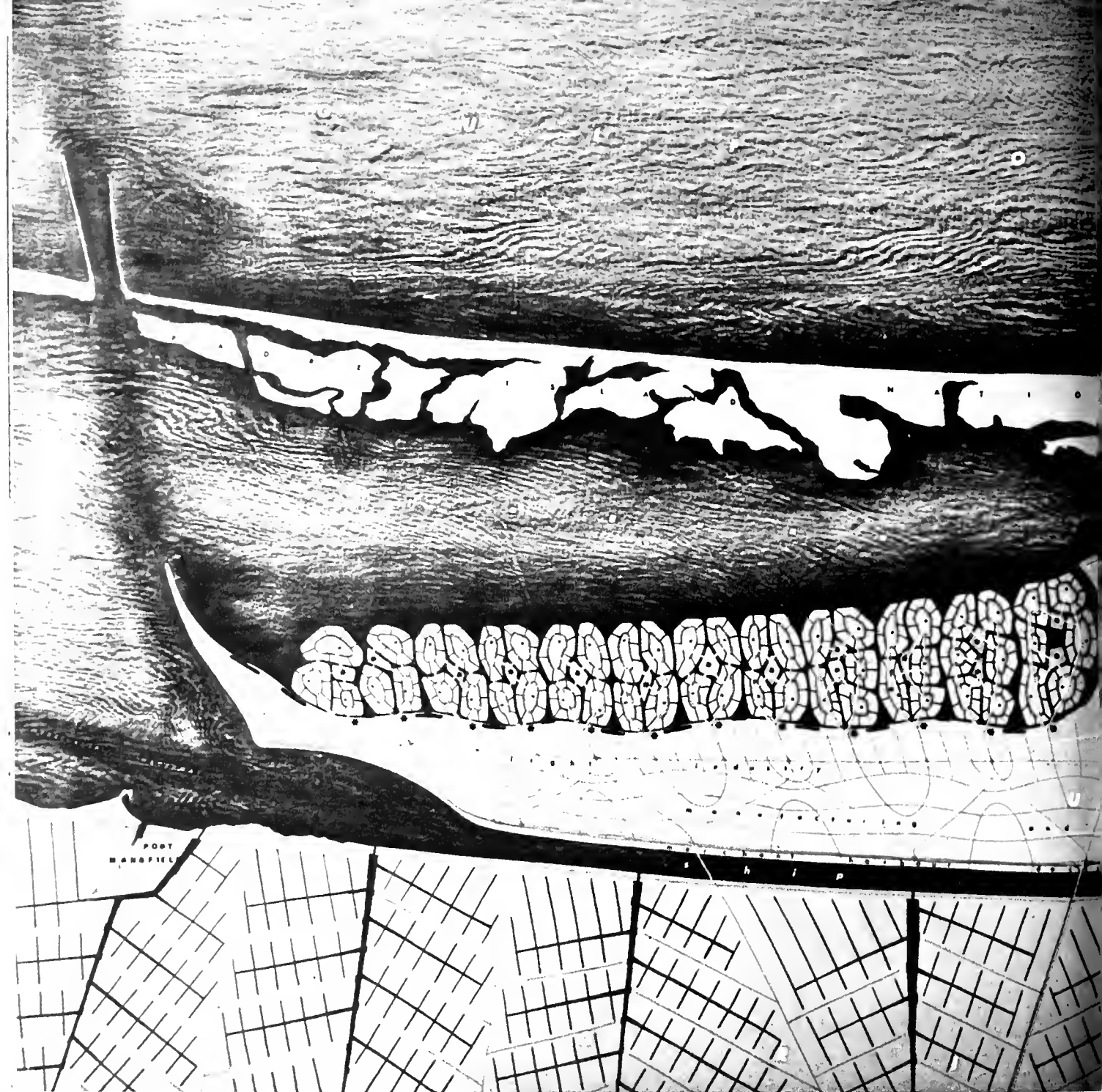
The purpose of POSEIDON is then to build a city which would be at the same time a superb sea resort and a thriving agricultural and fishing community with most of its activity aimed at the development of its natural resources. We chose this particular site because of the new 80-mile national park established on Padre Island. The city would be built out of the tidelands of the Laguna Madre, leaving the island intact as the desert island which every one dreams to own someday.

This site, situated at the head of the rich agricultural Rio Grande Valley, would allow for the development of citrus fruit farms and other natural products characteristic of the climate and land, drained and irrigated by canals.

Other areas of the hundreds of miles of laguna which is crossed by the intracoastal waterway could be set aside for another possible site to build another great laguna city. Matagorda Bay is one among many of these possible sites.

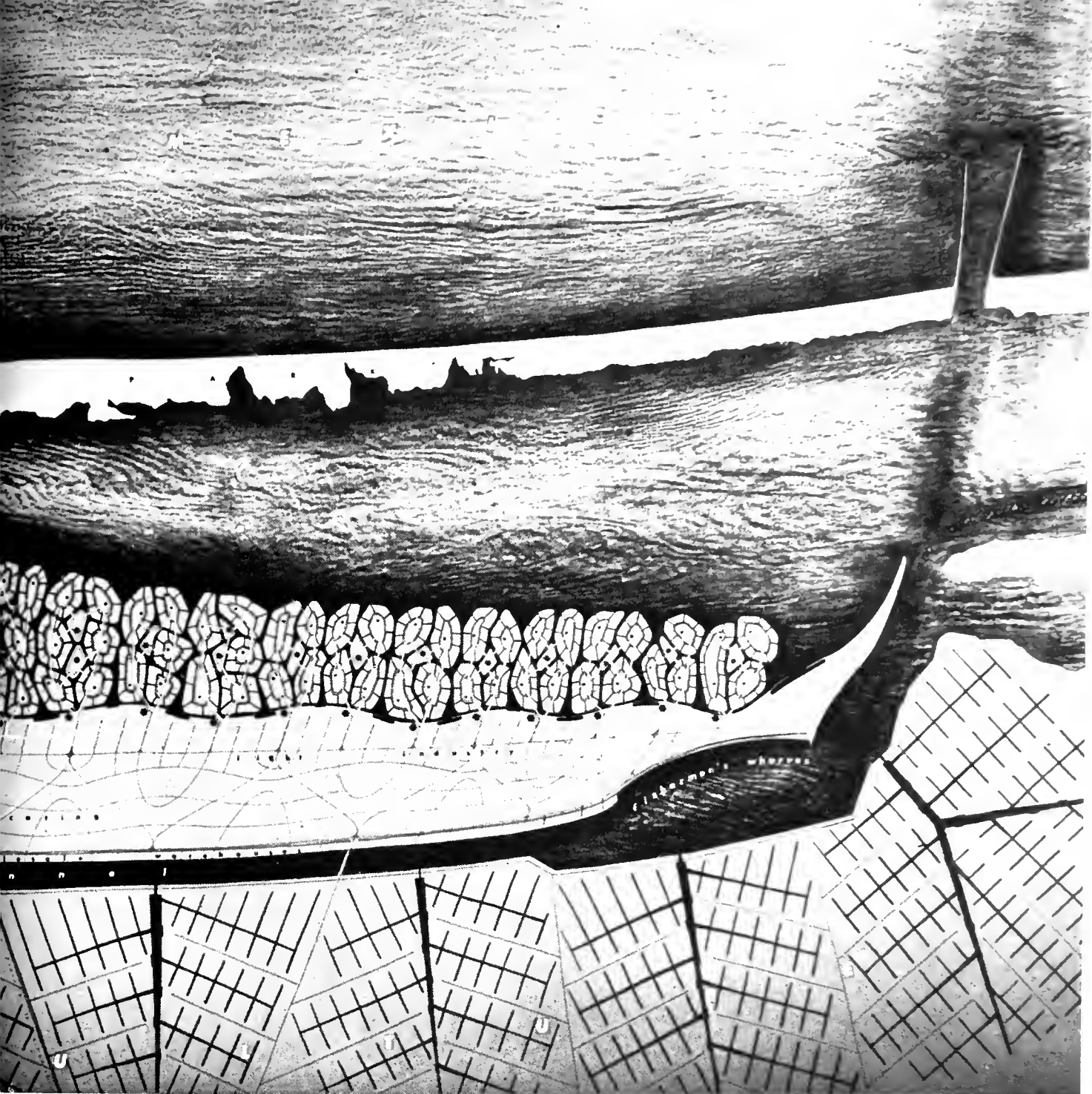
Venice, Amsterdam, Bangkok are thriving and superb canal cities, their land gained on sterile marshes or even on the sea. They were built with medieval technology, their soil being raised with the help of spades and wheelbarrows. Today, with powerful dredges, this is child's play. If we consider that this land would be entirely gained from a vast expanse of tideland on a bay protected against tidal wave, storms and by a natural break-water of the coastal island, we can realize the economic realism of such a project which could very well start today.





The city itself is like an island, separated from the mainland by the ship channel which brings in and out food and supplies and backed inland by "barge farms" where the products from the soil are transported on canals, the gentlest and most economical way to transport delicate first quality fruit and produce. The barges bring their load to the warehouses of wholesalers who ship it from there to the retailers in the city or any other parts of the land.

The rapid transit line marks the separation between industry and residence, although there is a friendly intercourse between one and the other. The industrial area, from ship channel to rapid transit line, becomes more and more refined and specialized, from warehouses and



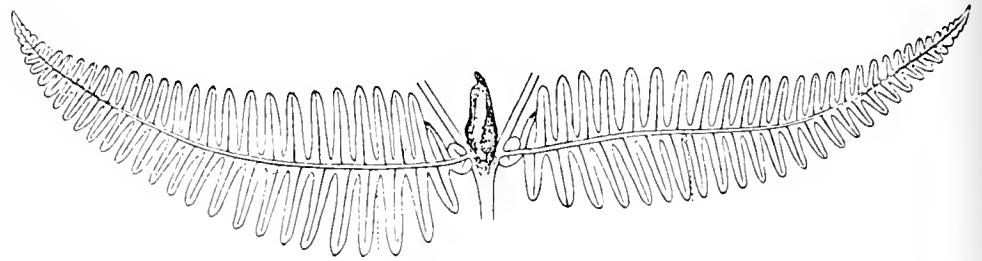
factories to electronic printing plants and business. The residential area is composed of clusters of row houses raised on stilts for tidal storm protection and also as shade-giving shelters. Each house owns its sea and land vehicle serviced by a canal and a road.

In the center of town, city government, hotels, beaches and a harbor where cruise ships and commuting boats can dock offer all the resort facilities expected from a great seashore city.

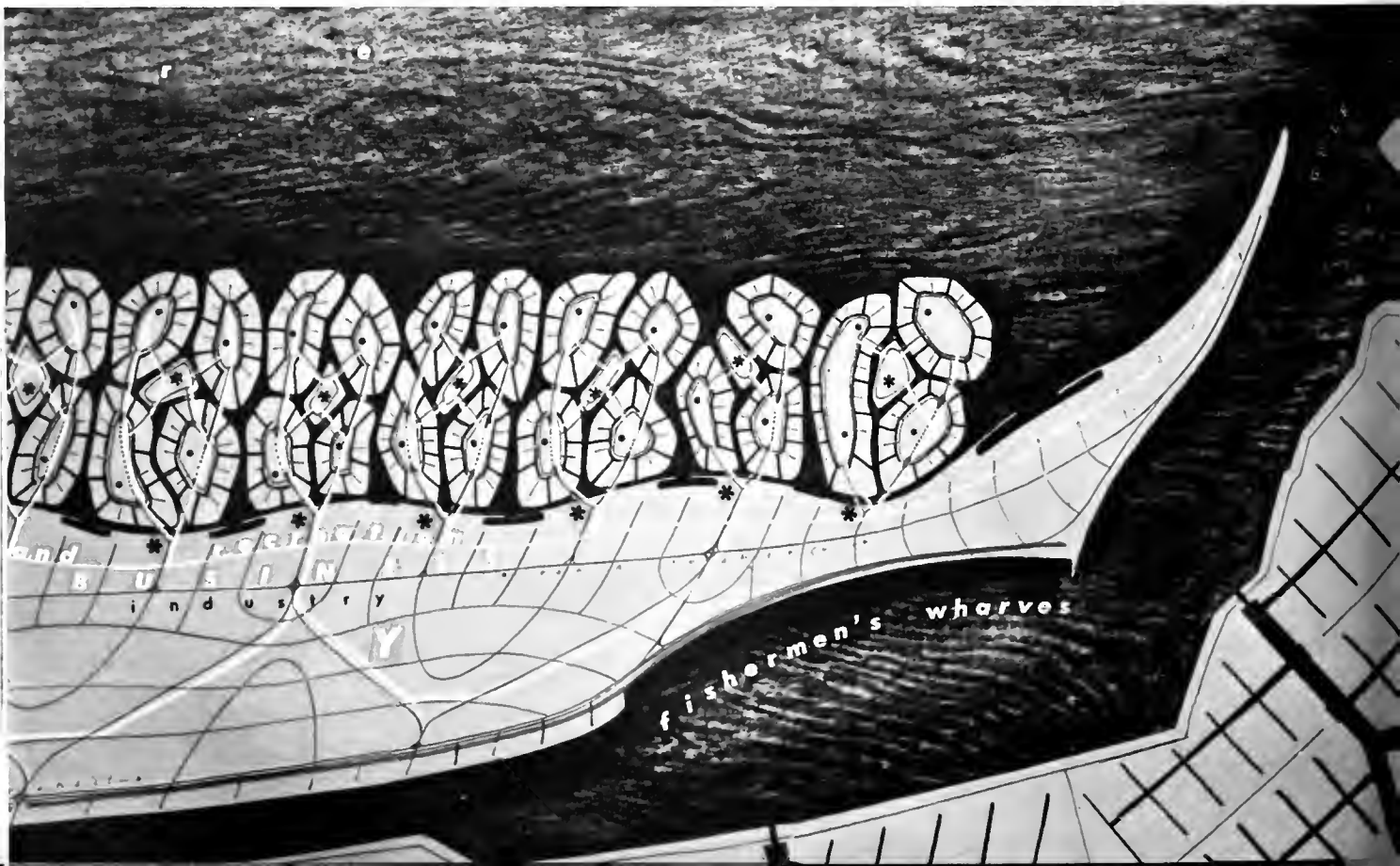
Padre Island, the "desert island of our dreams," is only accessible by sailboats and pedestrians. No building, no pre-arranged picnic areas or other will mar the integral authenticity of its wilderness washed by the noble breakers of the Gulf.

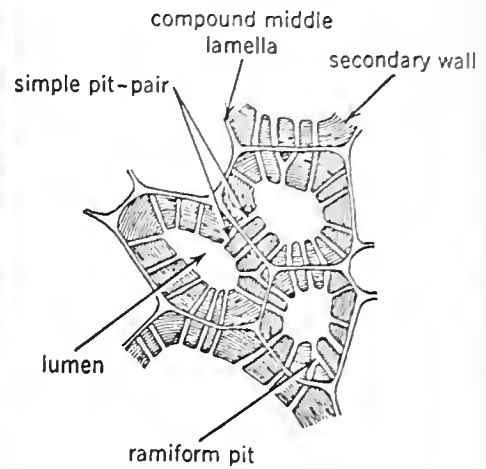
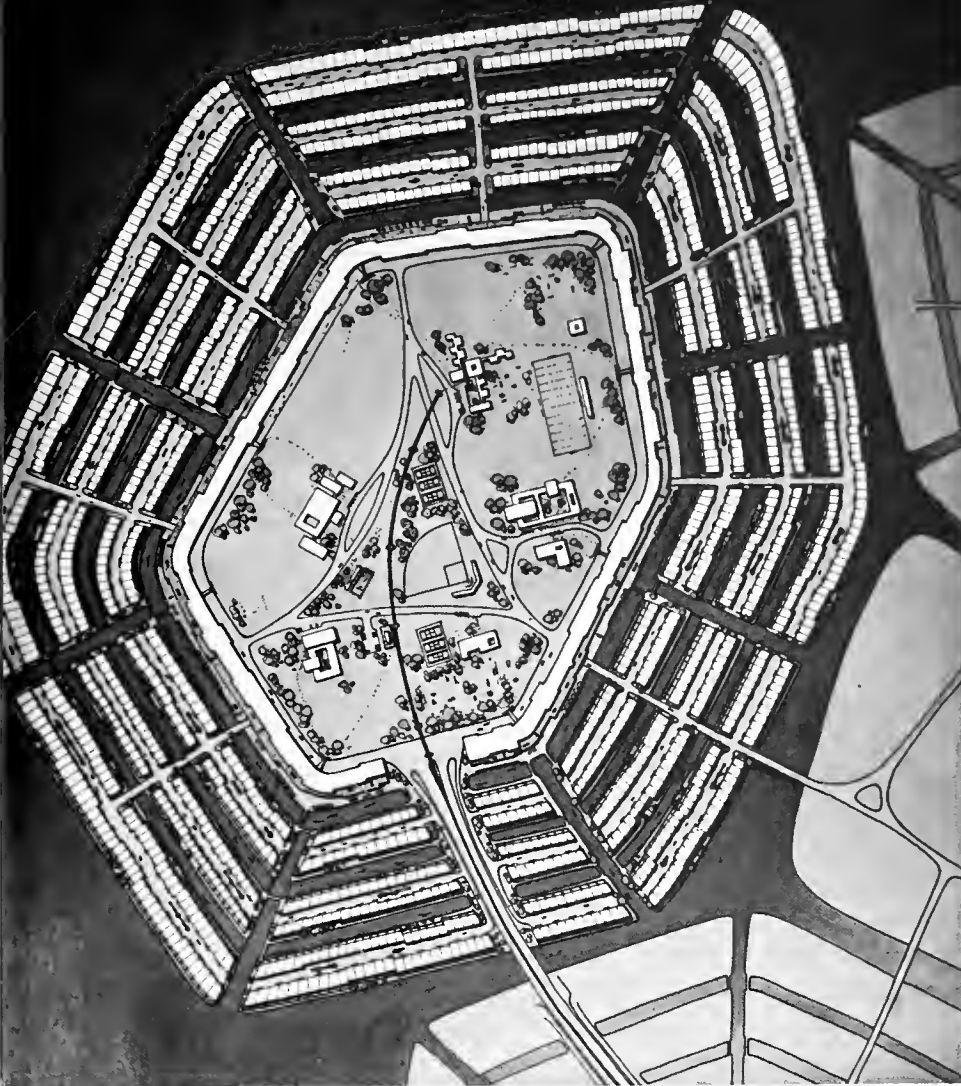
Each cluster represents the size of a village (four to five thousand souls) and owns one or two grammar schools. Each group of clusters, becoming larger as we reach the center of town, is the size of a small town (20 to 30 thousand souls), and possess one or two junior high schools and a high school placed on the public land devoted to education, sports, and entertainment.

Without trying to copy natural forms, we had the delightful surprise to find, once our design was finished, fully developed organic forms in nature that show similar designs. We cannot resist showing some of these natural forms of life where the design gives every leaf, every cell a free access to the life giving oxygen of the air and brings food and the pulse of sap and blood to every cell of the organism.



- \* elementary school
- \* junior high school
- \* high school



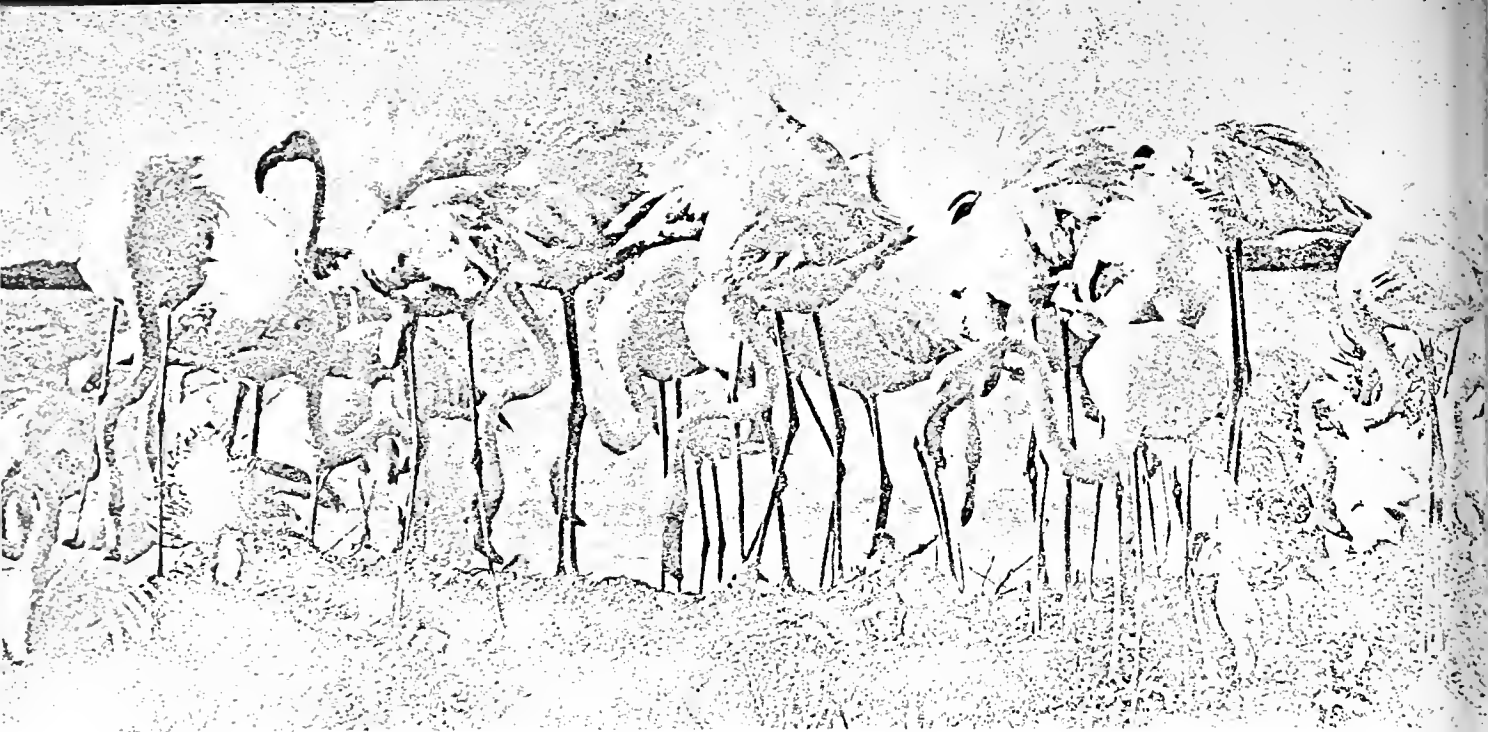


Cells with secondary walls and simple pits.

sclereids from a transection of *Cydonia* (quince) fruit.

This shows a typical cluster village serviced by an elevated transit line in connection with the rapid transit system and by roads. Every house faces a canal on one side and a street on the other. (See next page.) The shaded area directly underneath serves as garage and boat dock for either conventional type of vehicle or amphibious car-boat. No speed boat is allowed in the community.

The central park offers all public facilities needed by a community of this size, grammar school, library, post office, churches, etc., and omnisports practice fields. It is surrounded by a ring of shops, stores, offices and workshops also raised on stilts and offering parking underneath. The terraces are used for restaurants, cafes, etc. This village heart is within walking distance of all dwellings.



Flamingoes

Nature has designed flamingoes and raised them on stilts to wade on tidelands and marshes.

The little man, unaided by architects, found in turn the way to design his house in the most fitting manner to fit the same natural condition. Wherever we go on the gulf shore, we find this type of summer house, raised on stilts, providing a large shaded area underneath for the children to play, for picnics, rest. The boat is moored right in the front yard.

This same archetype, developed by the common sense of man, is to be found the world over. It was the type of dwelling of our first ancestors in the prehistoric lakes of Europe, the palafitti. It is the family dwelling indigenous to the shores of Lake Tchad, in Africa.

Canal Development on Galveston Bay



Lake Tchad Dwelling





"Take care to learn before, and to observe,  
The wind, and changing temper of the air,  
The soil, and native genius of each place,  
What fruit it bears, and what it will refuse."  
VIRGIL, Georgics

## AEGEA

Under the sign of Venus we have placed AEGEA, a figure used by the naturalist as the female symbol. The lake, indeed, is the womb which nourishes and shelters its children and gives them a sense of peaceful and delightful security. Instead of being a city turned toward the outside world of the sea, like Poseidon, it turns its life toward an interior world of life-giving water.

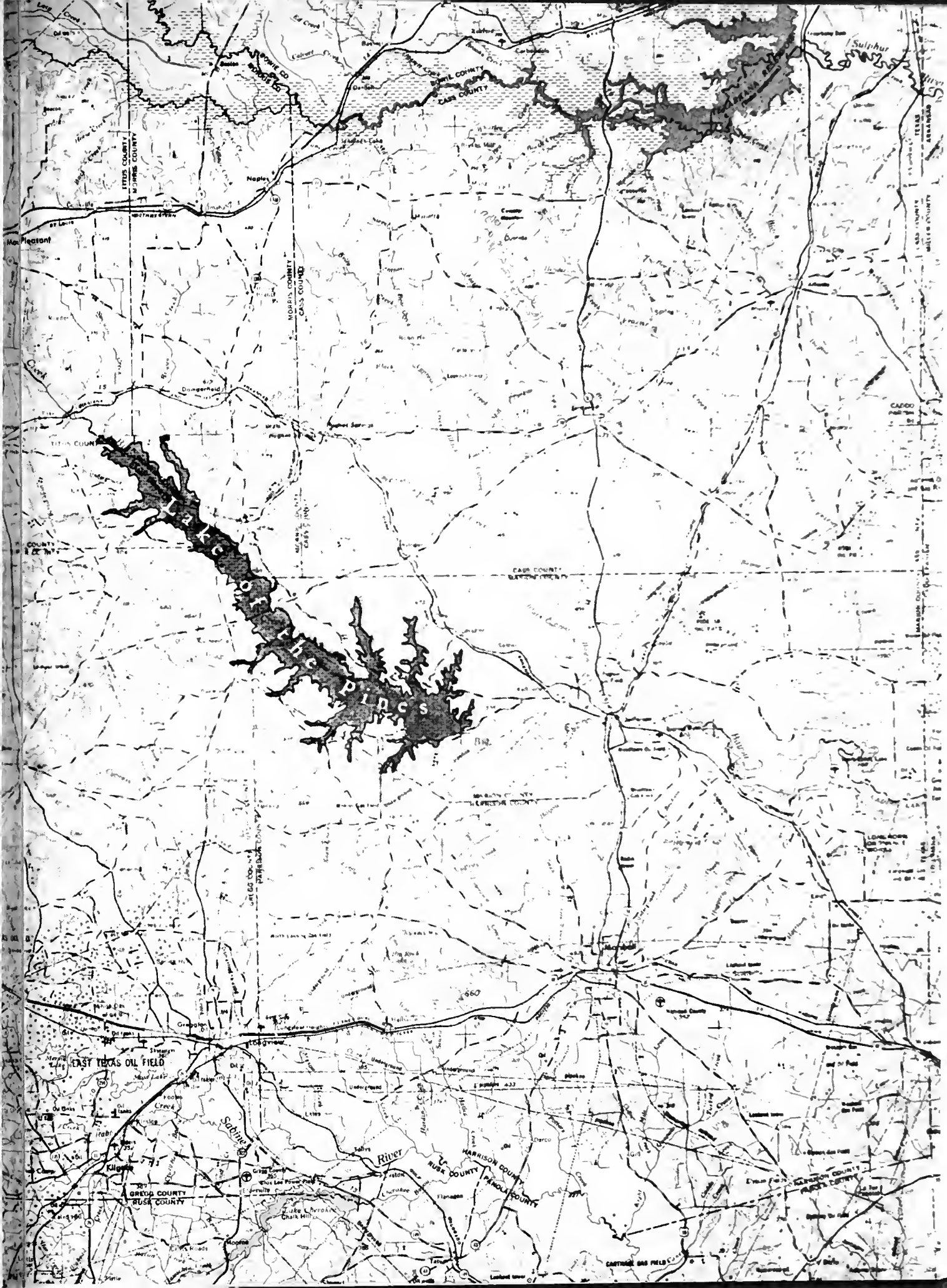
This lake condition, created artificially by man by building a dam, is found in nature also, in glacial lakes where the frontal moraine of the receding glacier retained the waters from the higher valley. We know what a magnificent setting such lakes create for living. Italian lakes are the most delightful and famous examples. Lago Maggiore offers a comparable size and coastal design to Lake of the Pines.

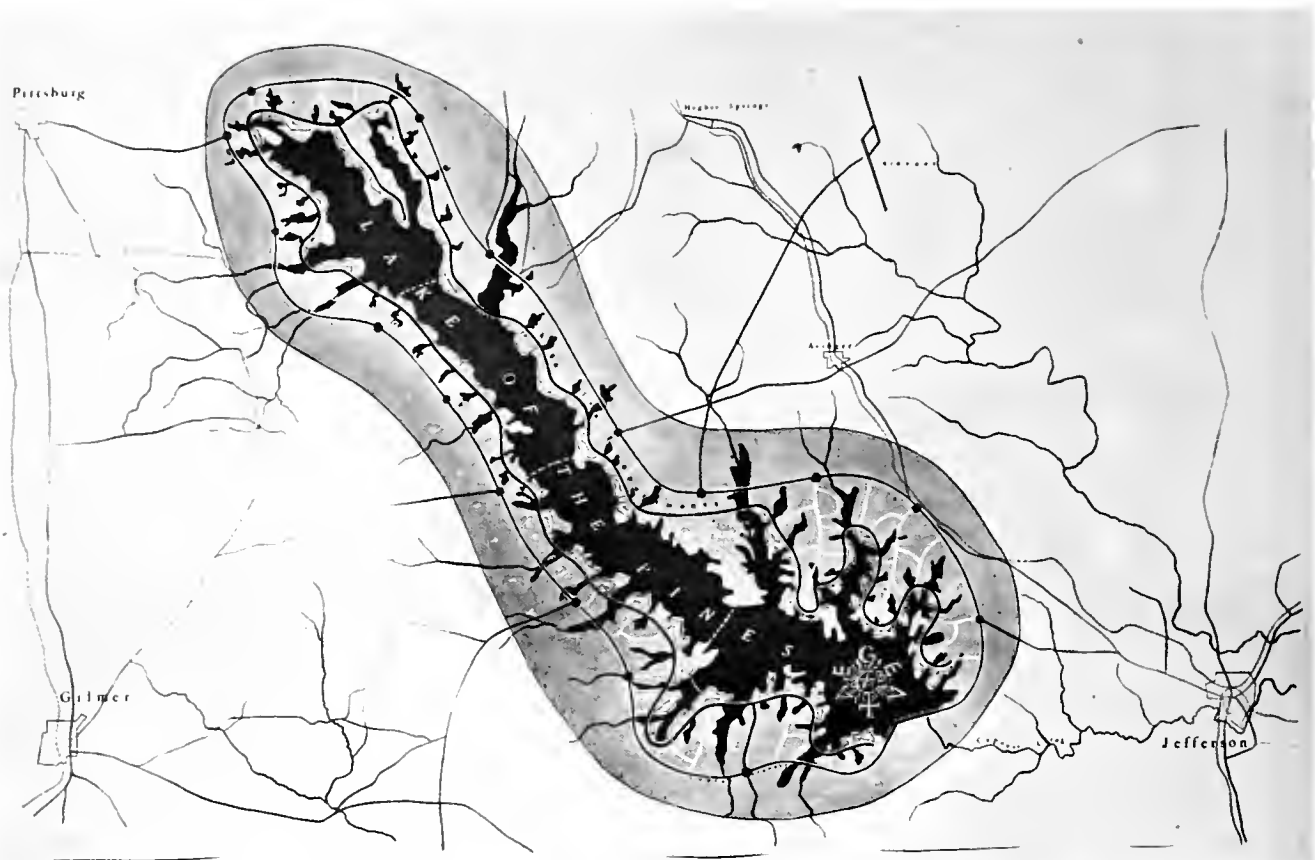
We have increased the interplay of land and water, hills and lakes by barring every glen with earth dams, a technique familiar to the Texas farmer, which requires little or no engineering. We have thus lit little flames of water all around the lakeshore, which expand inland the charm and beauty of smaller lakes glimpsed through a dense forest of pines from the hills above.

In Aquila we saw that the type of industry and work pertaining to research led us to a central concept for industry and airport as the need for heavy bulk of raw material is very limited as Aquila's industry is not a manufacturing industry but deals strictly in research and the design of prototypes. In any city, industry is twofold: the type of industry born of the land and its natural resources, and the "naturalized" industry which is by its very nature independent from geographic location, such as branch factories from a corporation.

The essential value of the indigenous type of industry must be stressed because it actually gives the city its local character. In Poseidon the indigenous industry is mainly fishing and produce and fruit farming with all its related by-products. Its design reflects this character.

The location of Aegea, within a vast woodland which covers most of East Texas, will orient its industry on basically the use of wood and its derivatives: from saw mills to paper mills, home prefabricating, furniture, printing, chemical processing of wood, and such by-products as plastics. This character, directly born from the landscape and the land, will give to the city its stable and permanent flavor, its originality and uniqueness.

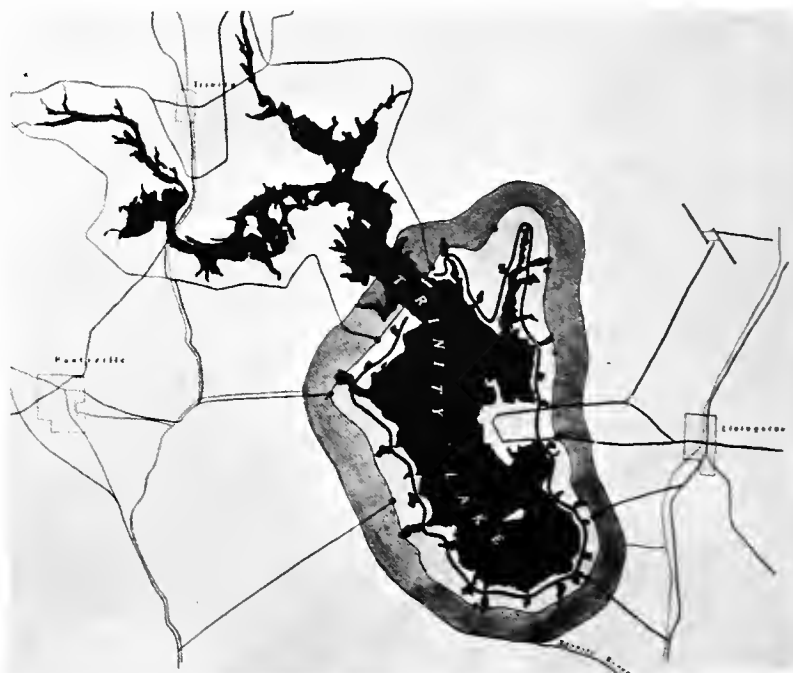




LAKE OF THE PINES, on Big Cypress Creek  
128 miles east of Dallas  
28 miles in length  
3 miles maximum width



PECAN LAKE, on Pecan Bayou  
Near Brownwood, 120 miles NW of Austin  
20 miles in length  
3 miles maximum width

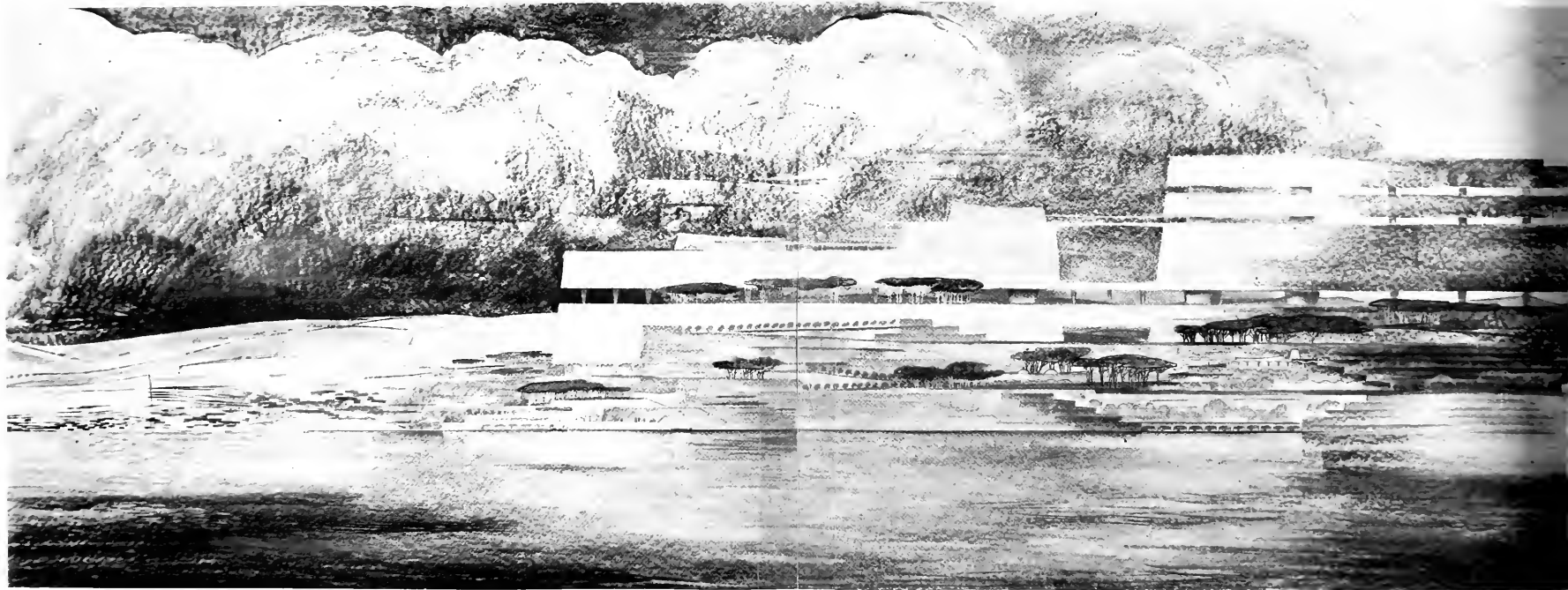


TRINITY LAKE, on the Trinity River  
67 miles north of Houston  
38 miles in length  
8 miles maximum width

UNFOLD



"And, in truth, every soil can not produce everything. Willows grow beside the rivers, and alders in miry fens. The barren wild ash on the rocky mountains; the shores are mostly favorable to myrtle groves: in fine, Baccus loves the sunny hills; the yews, the north wind and the cold."



"Behold the world submitted to the laws of husbandman who live in its remotest regions: each different country had its different trees. India alone produces black ebony and the frankincense-tree belongs to none but the Sabaeans."

"Wherefore come on, O husbandmen, learn the mode of treatment peculiar to each kind, and improve wild fruit by cultivation: nor let your lands lie idle: it is a delight to plant Ismarus with vines, and clothe vast Taburnus with olives."

"On the other hand, the olives require no culture; nor do they look for the crooked pruning-hook and gripping horrors when once they have gained a hold on the ground, and have stood the blasts. Earth of herself supplies the plants with sufficient moisture when loosened by the bent prong of the hoe, and yields weighty crops when opened by the share. On this account foster the olive, which is rich and pleasing to the Goddess of Peace."

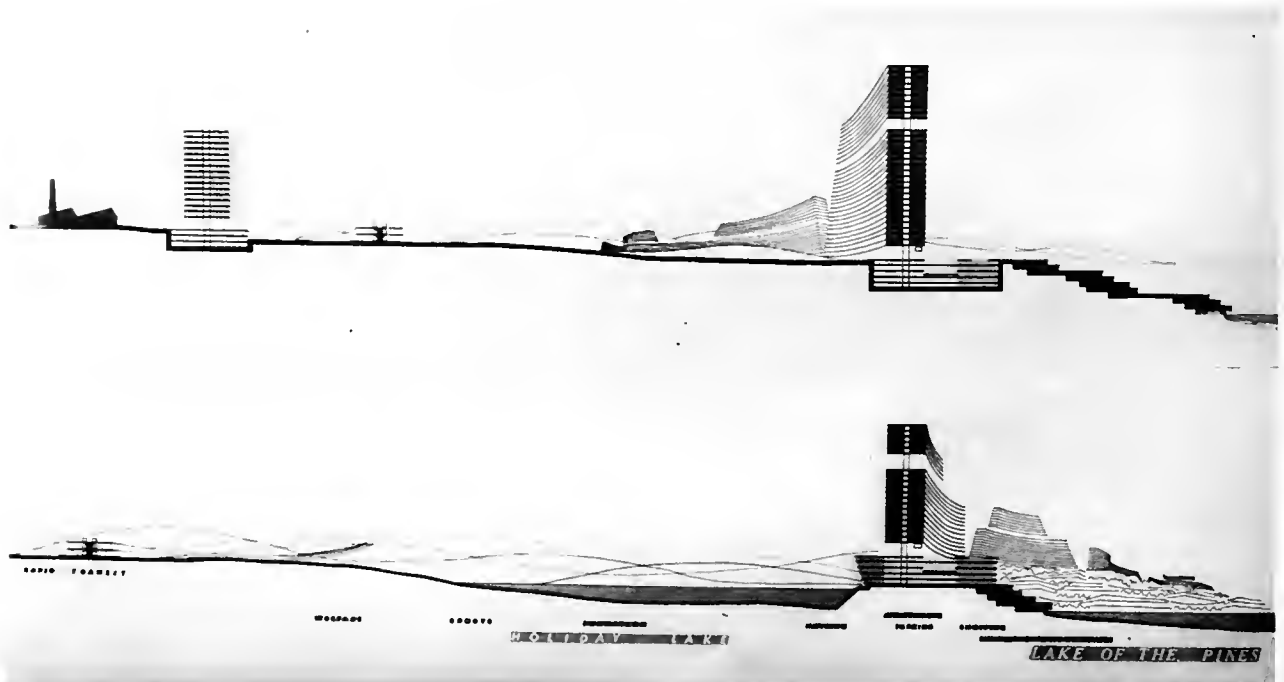


"The fruit-trees too, as soon as they feel their trunk vigorous, and acquire their proper strength, quickly shoot up to the stars by their own native powers, and need not our assistance. And no less surely, meanwhile, every grove is laden with produce, and the untended haunts of birds are crimsoned with blood-red berries: the cytissus is cropped; the tall wood supplies torches; and our evening fires are fed, and send forth floods of light. And do men hesitate to plant their trees and bestow care upon them?"

VIRGIL, Georgics

The upper section is cut on a high point of the land where the high rise line of transit is level with the top of a hill. The lower section is cut through one of the earth dams and shows to the right Lake of the Pines and to the left one of the small tongues of water retained by earth and buildings as by a dike.

The construction under the high rise apartments is planned for business and work. Toward the smaller lake are placed offices and shops for liberal professions, crafts, and small industries. Under the high rise is a parking garage. Between the high rise line and Lake of the Pines, a commercial area offers a surface mall and substructures for housing the shopping floors of department stores. The construction continues to the very edge of the lake with the interplay of pyramid and cliff dwellings as shown schematically on page 53. It is the Aegean type of town with its clusters of terraced homes, arbors, hanging gardens down to the lake.



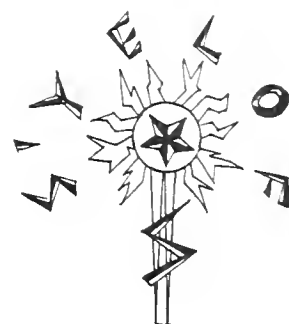






This plan represents part of the south area of Lake of the Pines. From right to left, it shows the shoreline with its residential, business and small industries along the high rise line of transit. Between high rise and rapid transit lines are located all public facilities such as schools, recreation and welfare. It is also devoted to agriculture, orchards and quality produce farming. Some of the heavier industrial facilities are shown to the lower left corner of this drawing.





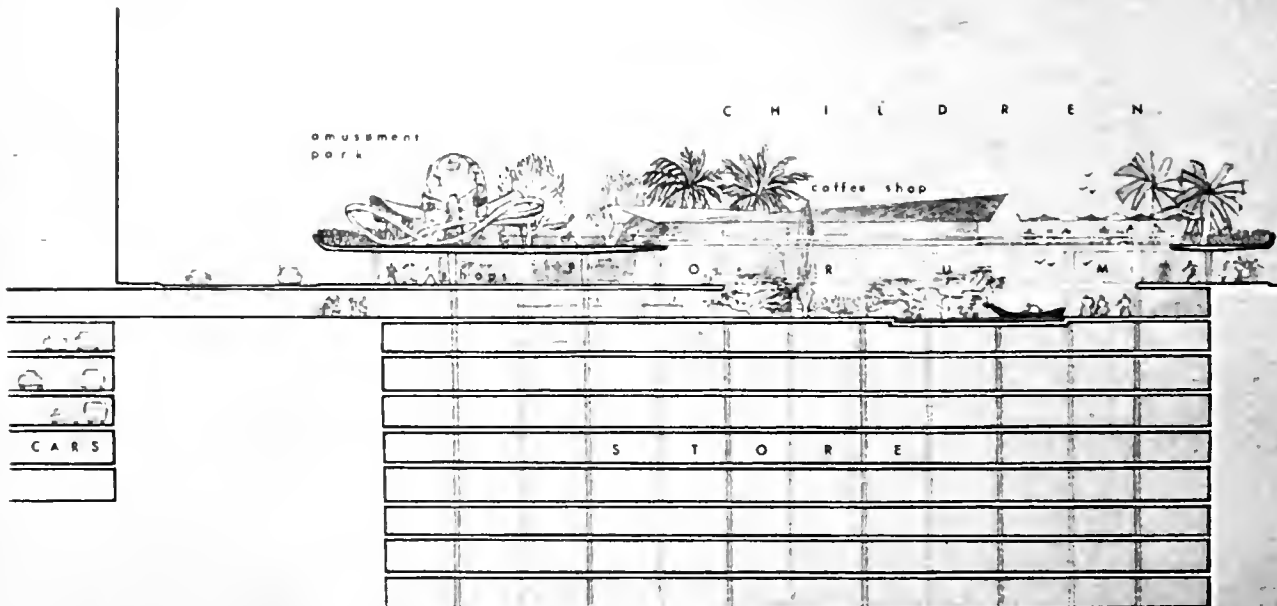
Supplement: solution offered  
for urban renewal project for  
Midtown America - S'YELOF

A department store today is more efficient without windows, as the periphery of each floor is used for the storage of goods on sale and display on the rest of the floor area.

As a result, these stores are built as huge closed tanks, offering only a "windshield" first floor only used for entrances and display windows.

This first floor is the glamor floor of the store, where the best is shown for impulse buying. The other floors are specialized by departments.

Let's see what we gain by reversing the layout, placing the tank in the ground, and opening the first floor to the sky:



In this concept we have taken a typical city-block (300 feet wide) housing one of the leading department stores of a city, Foley's in Houston for instance, and we tried to see what happened if we built it upside down. The result is a gain not only in the city's make-up, but also in the efficiency of the business. This allows, right in the center of town, an oasis of shopping delight planted with flowers, shrubs, and trees gracing the view for the outside offices of the skyscrapers across the street. This oasis, truly a "Forum" in the authentic sense of the word, provides for pedestrians all the charm of outdoor life with extensive shelter against rain and sun.

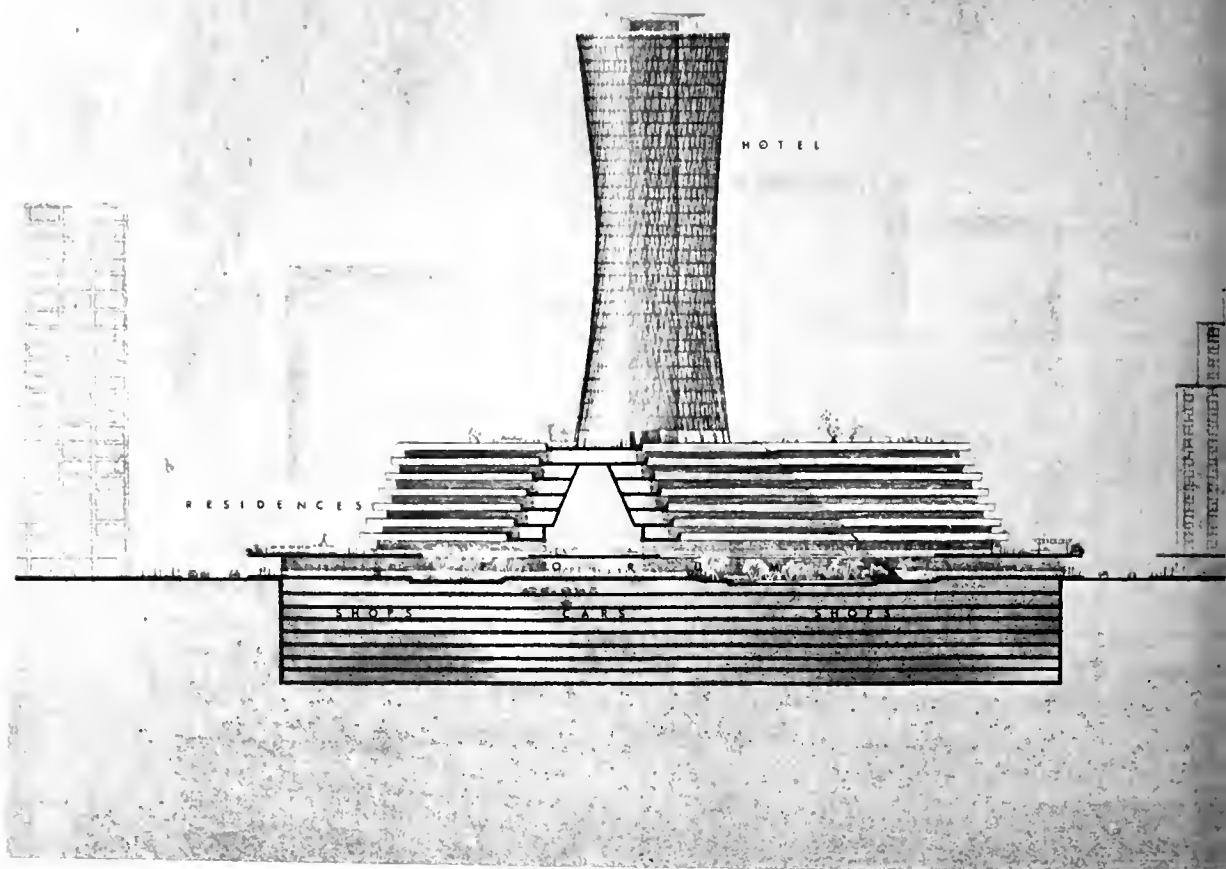
The terrace above is used as a children's playground to take care of the baby-sitting problems. This added attraction would serve the publicity of the store better than any paper advertising: a restaurant and coffeeshop bridges the two sides of this playground terrace where can be found all that children dream about, a playland of water chutes, toboggan car-bumping rink, a zoo, a pin-ball machine haven, the whole area serviced by a scenic railway.

A tunnel links under the street an underground parking garage to the main floor of the store.

The air conditioning operating cost of such a building would be considerably reduced due to the total insulation of the "outside" walls. The water from de-humidification through the process would be used to feed waterfalls, pools and fountains instead of being wastefully discharged into the air from one of those huge and ugly evaporators which disgrace the top of our buildings today.

If we consider also that bulk transportation would arrive in trucks, by a simple process of gravity, chuted down through the various floors, and that costly upward transportation would be done automatically by each customer carrying his own little package of goods, we can realize the many-sided advantages of such a layout, regardless of the improvement in downtown area.





If we consider the use of four adjoining blocks (600 x 600 feet) instead of only one, we can create a village right in the center of town in an integrated complex of residences, stores and churches.

In this concept, a three-point garage-apartment complex groups 200 apartments of various sizes on the outer shell of the structure on six floors. The space in between is used for convention halls, theaters, and churches. From its center high rises a convention hotel, the terrace top of the pin-wheel residences being used for outdoor entertainment, mostly swimming. The malls created by the star-shaped apartment complex become three garden-and-water oases, each one given the character of some famous tropical landscape of the world, enhanced by special restaurants typical of each of these countries, graced by authentic folk music and entertainment. Each oasis is the equivalent of the Forum described in the preceding scheme.

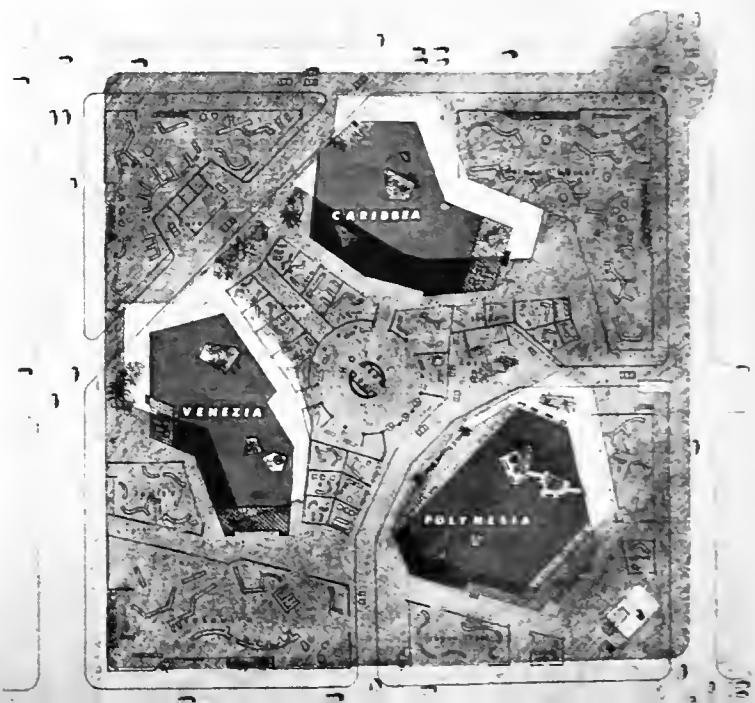
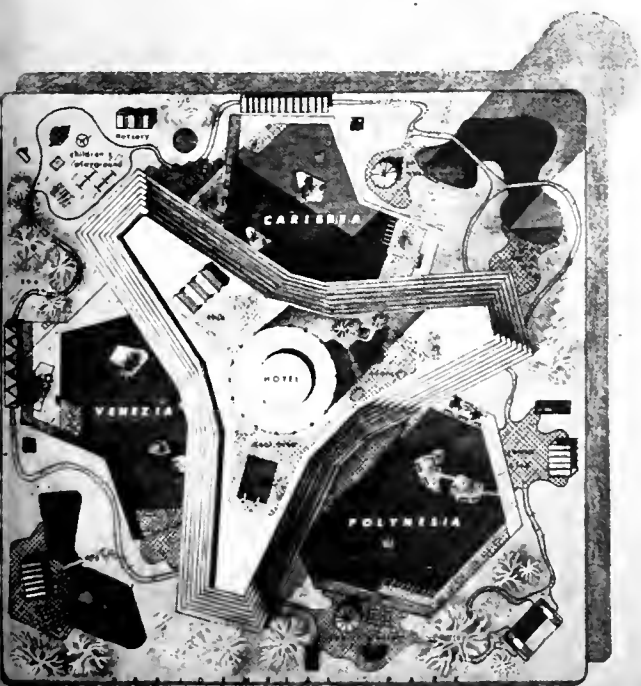
The shape of this high rise building may seem incongruous at first, but it was developed for two essential reasons.

First was to design a structure least vulnerable to wind stresses. We take too much for granted the enormous added cost to a high structure due to wind resistance. A slab is probably the worst we can design for economy in this regard. A cylinder is certainly the best, as it offers the same resistance in all directions of the compass (and this is mostly important in hurricane regions due to rapid shift of possible 100 mile an hour winds from two opposite directions within a few hours), and its geometry deflects the impact around it. As a matter of fact, there is actually a negative pressure (in other words, a slight vacuum) at the point of impact. During World War II, after the systematic bombings of Coventry, England, the only structures left standing were the smoke stacks of factories raising high into the air their non-reinforced brick cylinders, while all other buildings were razed to the ground. Street bomb shelters were thus designed in bullet shape by the Germans in Berlin at the end of the war.

We don't need to point out the considerable economy in steel for neglecting wind pressure in a tall building.

A second important point solves also architects' nightmare in getting rid of the grid of columns which occupy the interior space throughout the floors. The hyperbolic surface becomes a bearing lattice of oblique columns interwoven just as the reeds in a basket. The floors span without intermediate columns the space between this outside lattice wall and the central vertical elevator core.

We don't need either to mention the advantage of having a hotel with all outside rooms, free from noisy, well-lit, inside courts which are the curse of most downtown hotels.





"Why should I insist on greater things?"

VIRGIL, *Georgics*

This project is coordinated with the activities of the Urban Research Center, Rice University.

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